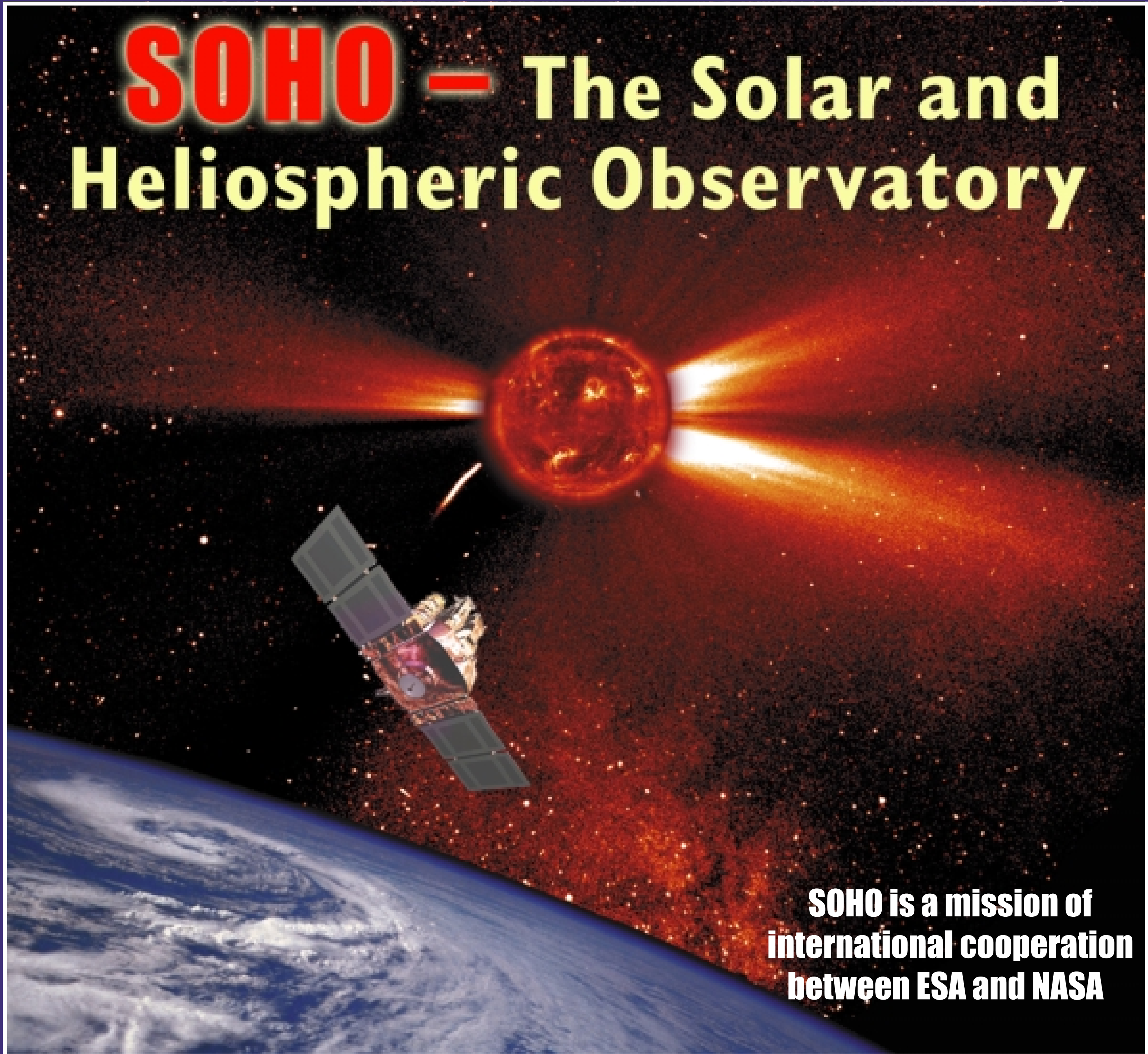
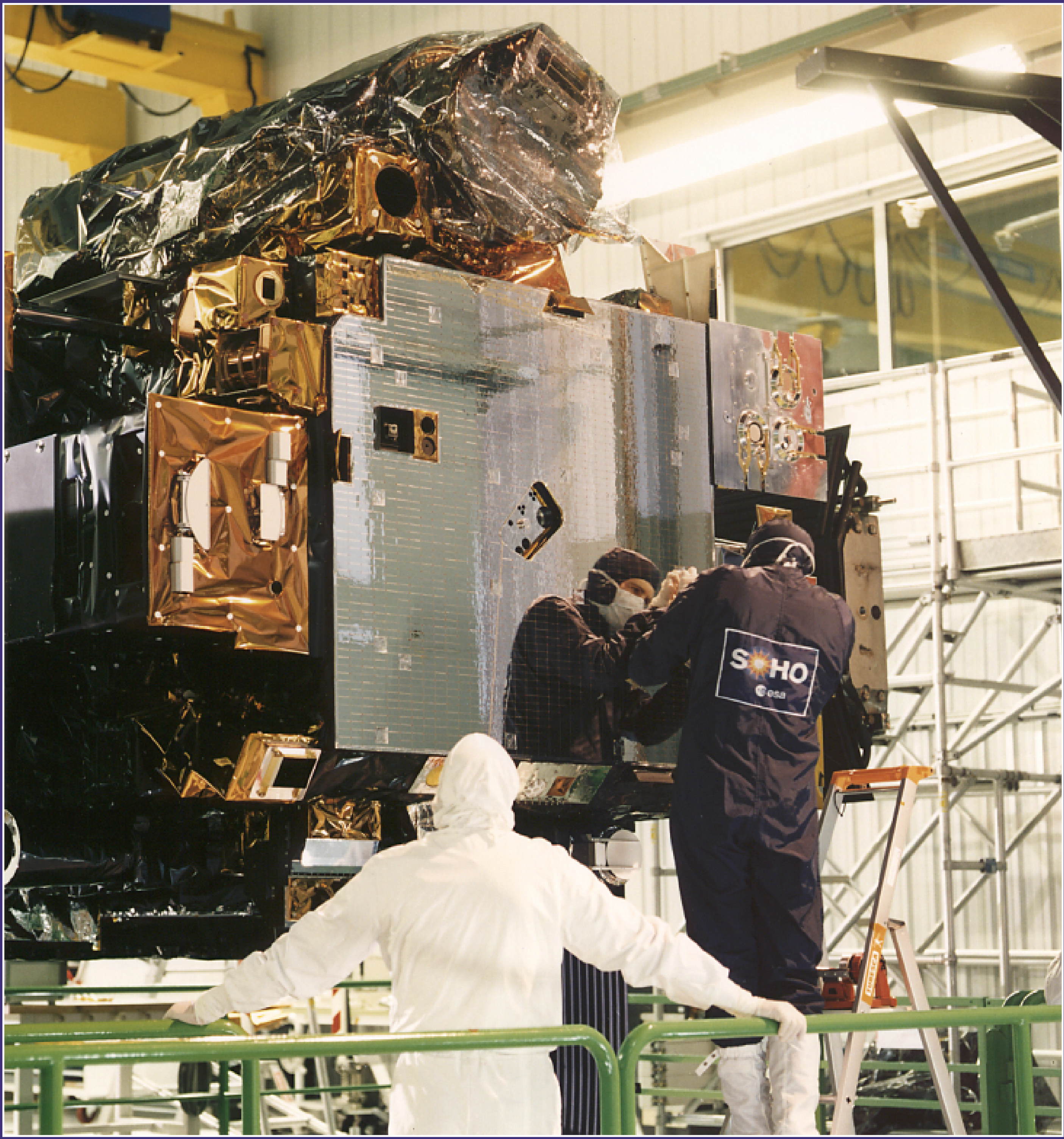
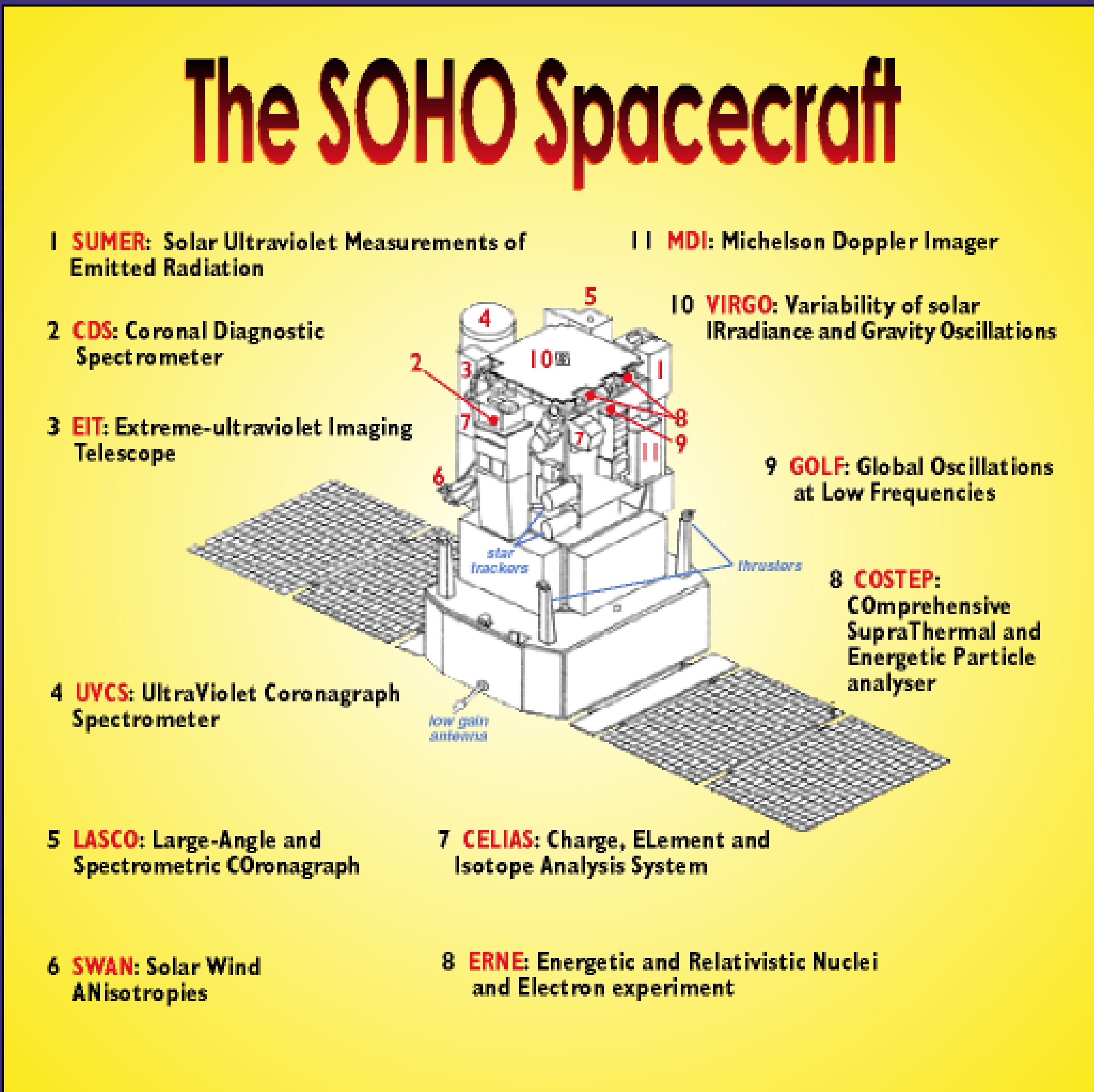
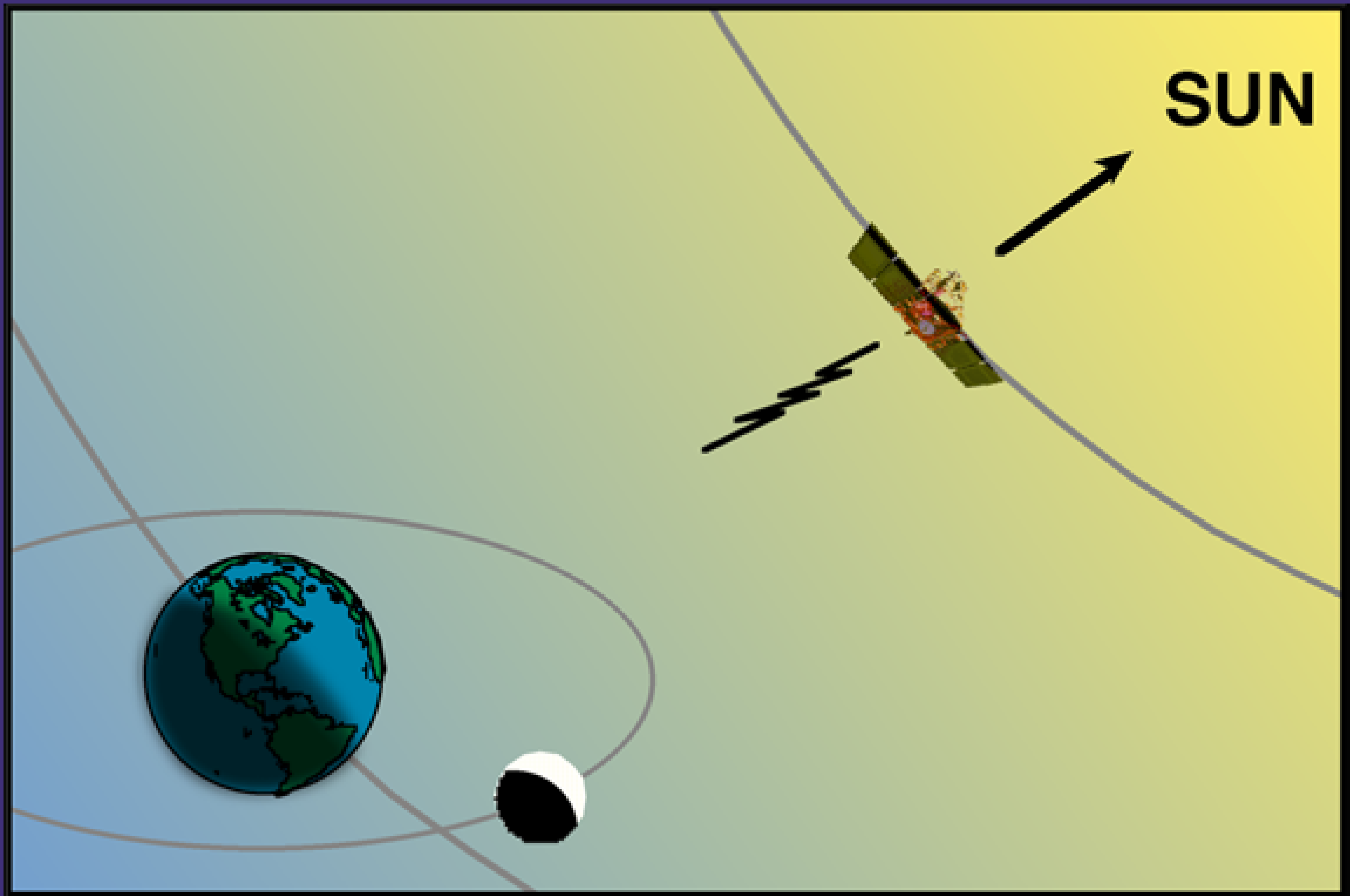

SOHO – The Solar and
Heliospheric Observatory
SOHO is a mission of
international cooperation
between ESA and NASA



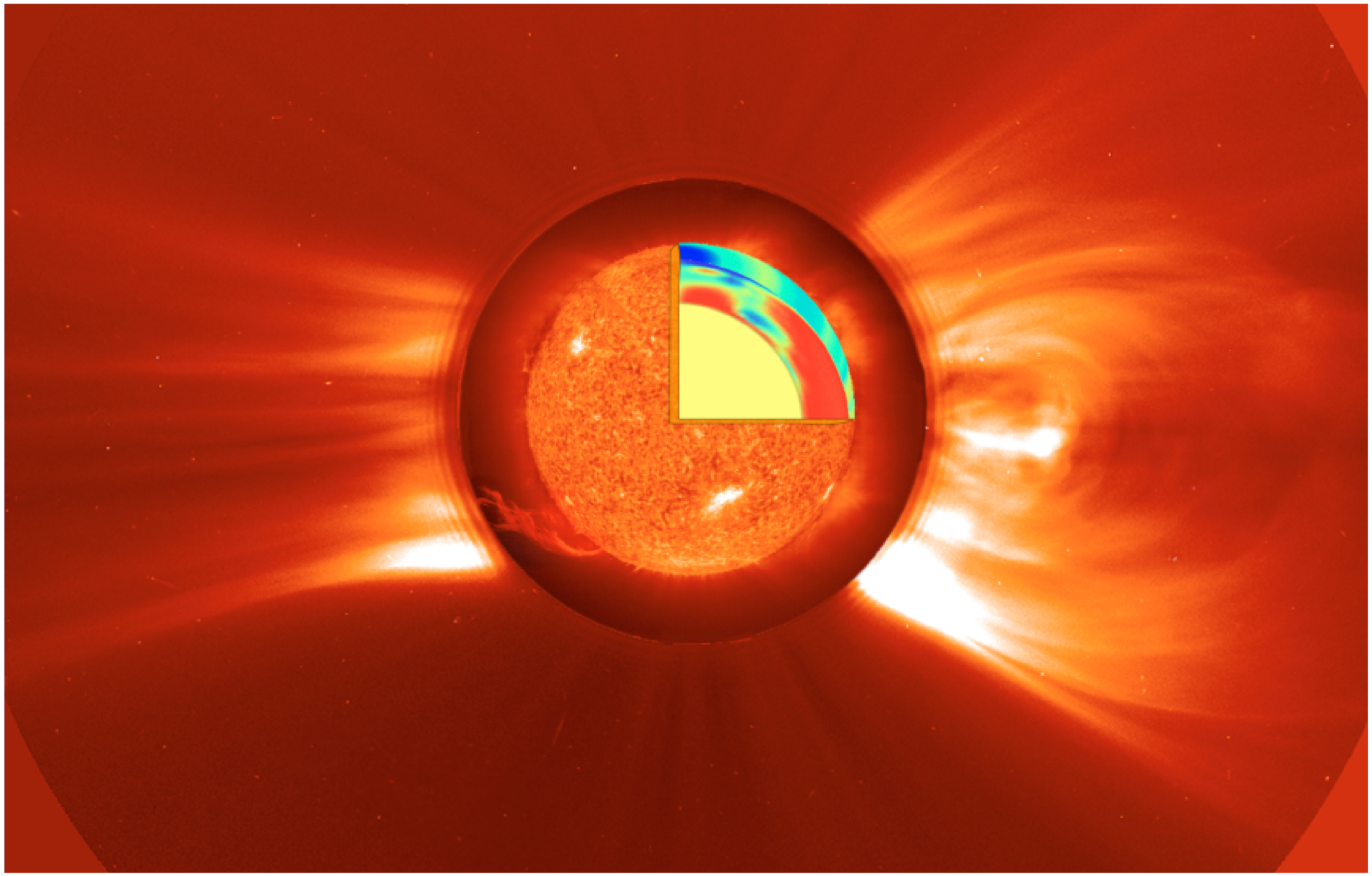
SOHO spacecraft being prepared for termal tests at Interspace in Toulouse, France



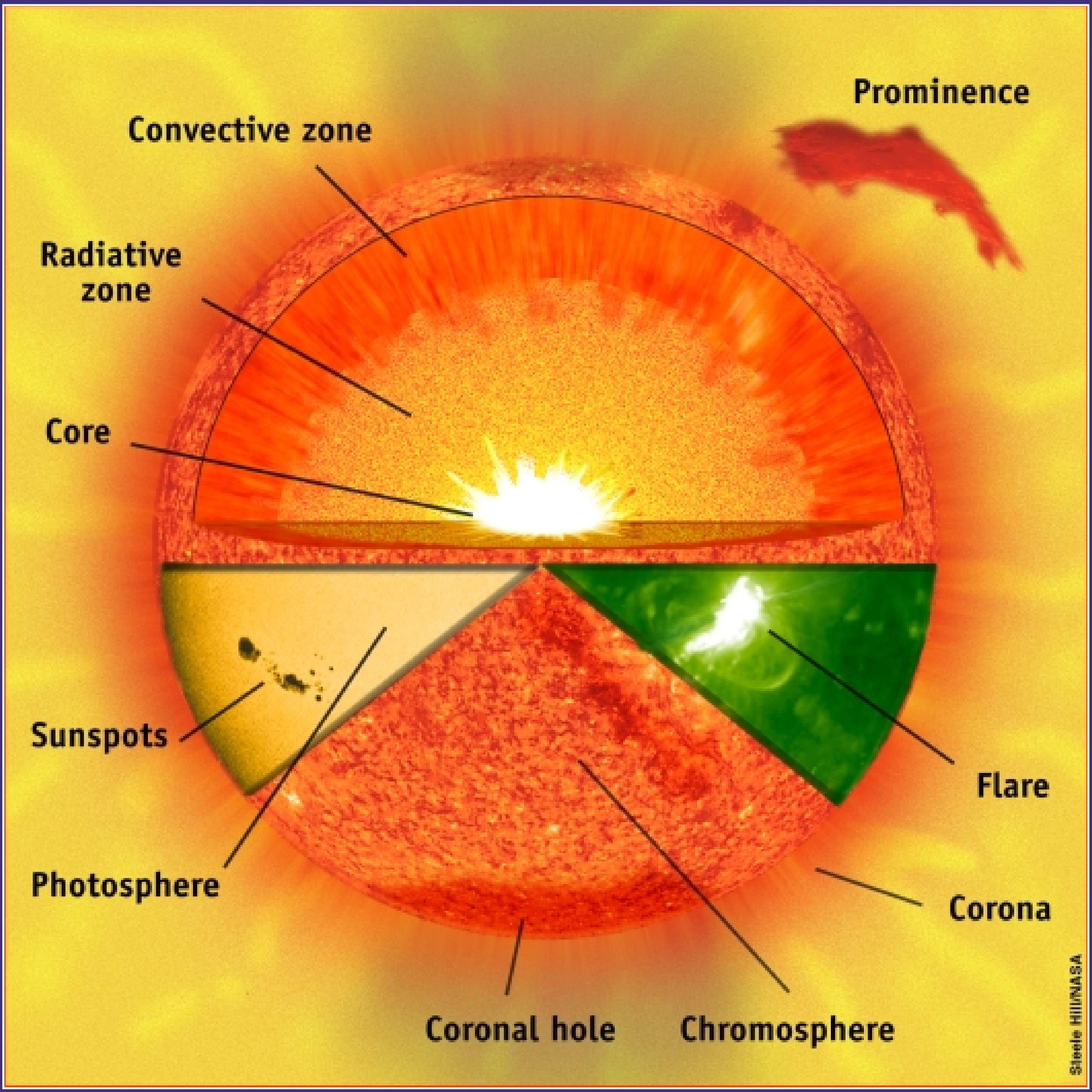
SOHO, a solar scientific observatory, has 12 instruments on board to observe the Sun 24 hours a day. It is a mission of international cooperation between ESA and NASA.



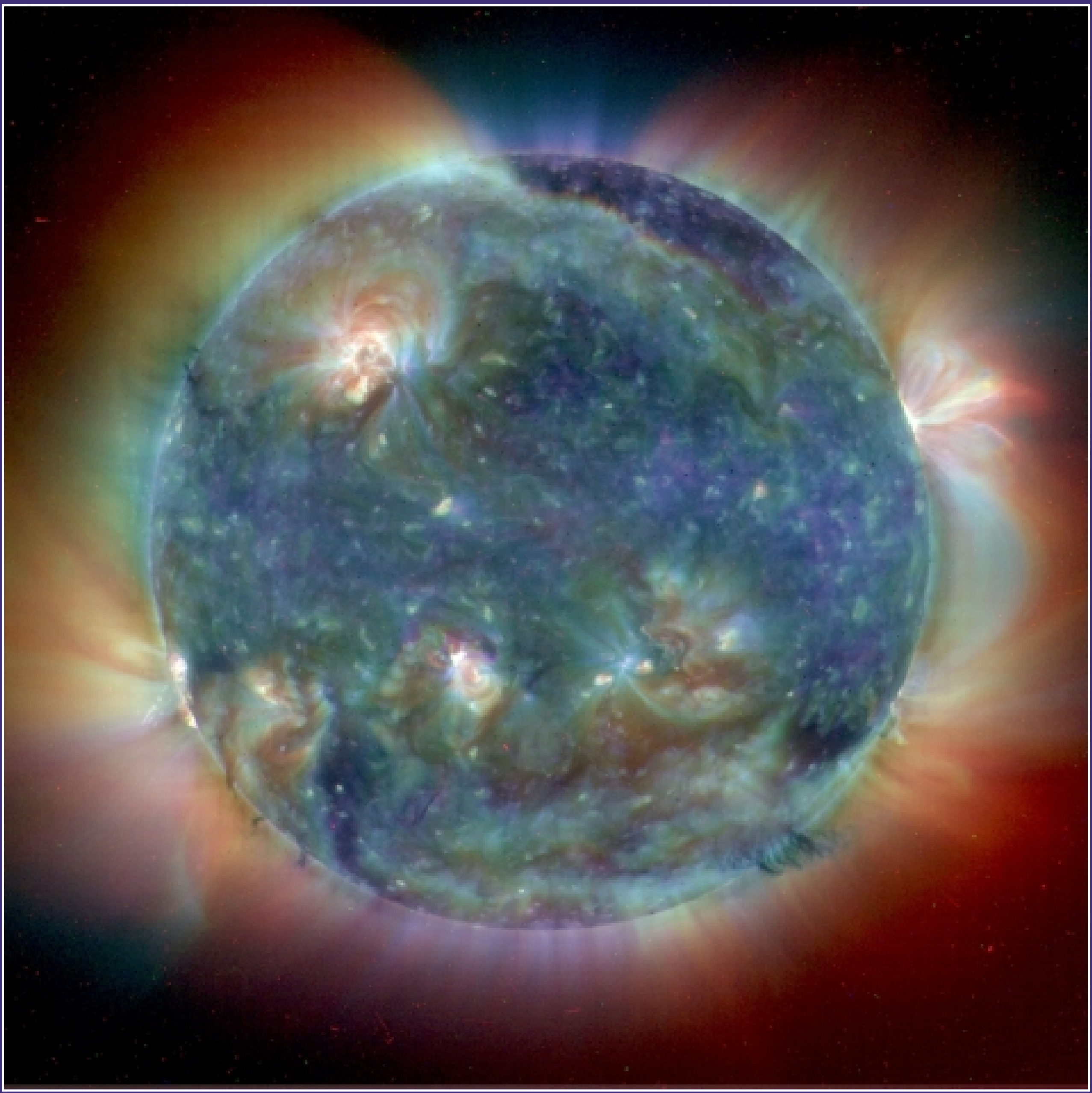
Schematic of SOHO’s orbital path in relation to the Earth, moon, and Sun – SOHO is about 1.5M km sunward of the Earth



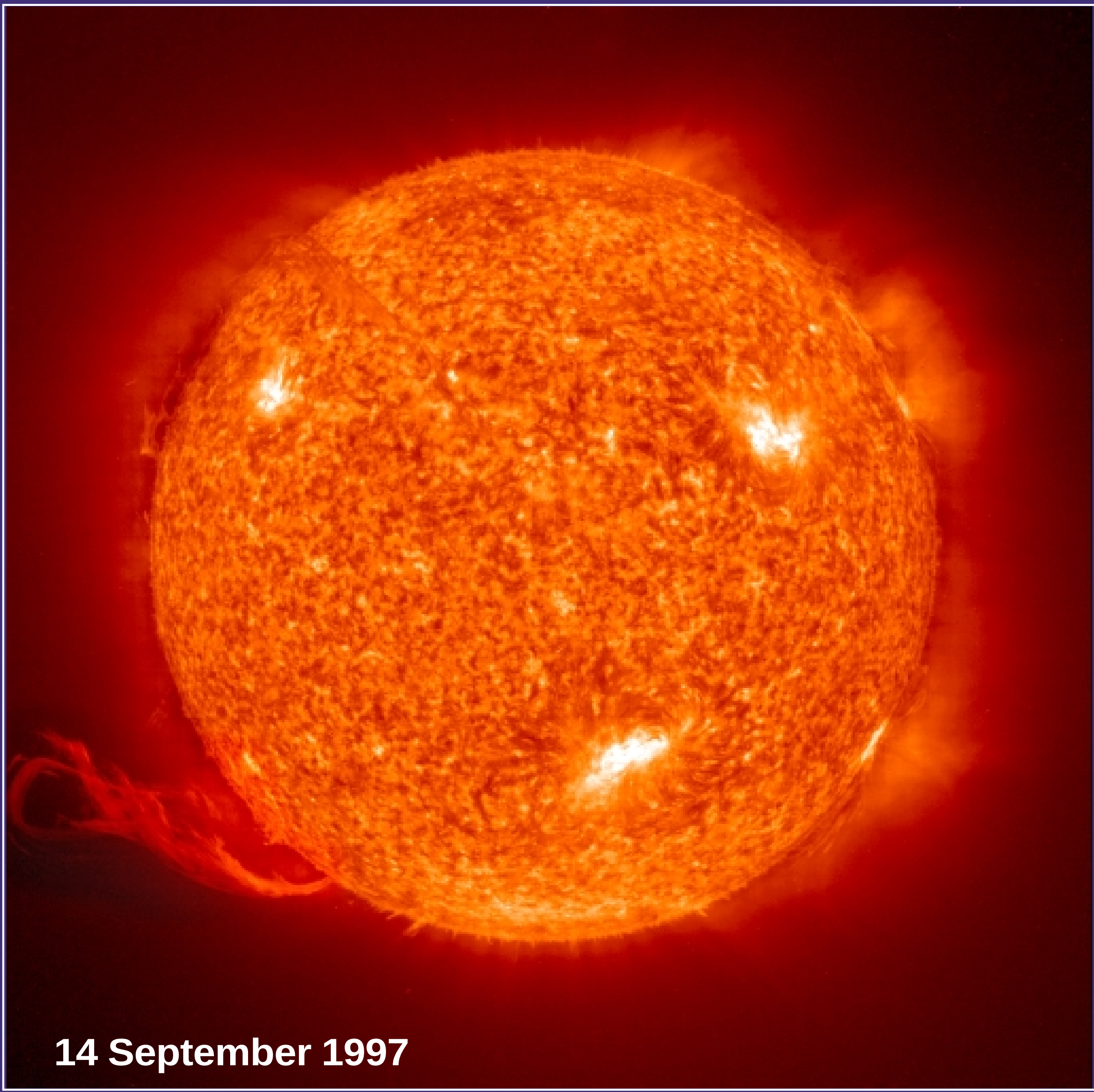
A composite image of the Sun that depicts the range of SOHO's scientific research from the solar interior, to the surface and corona, and out to the solar wind



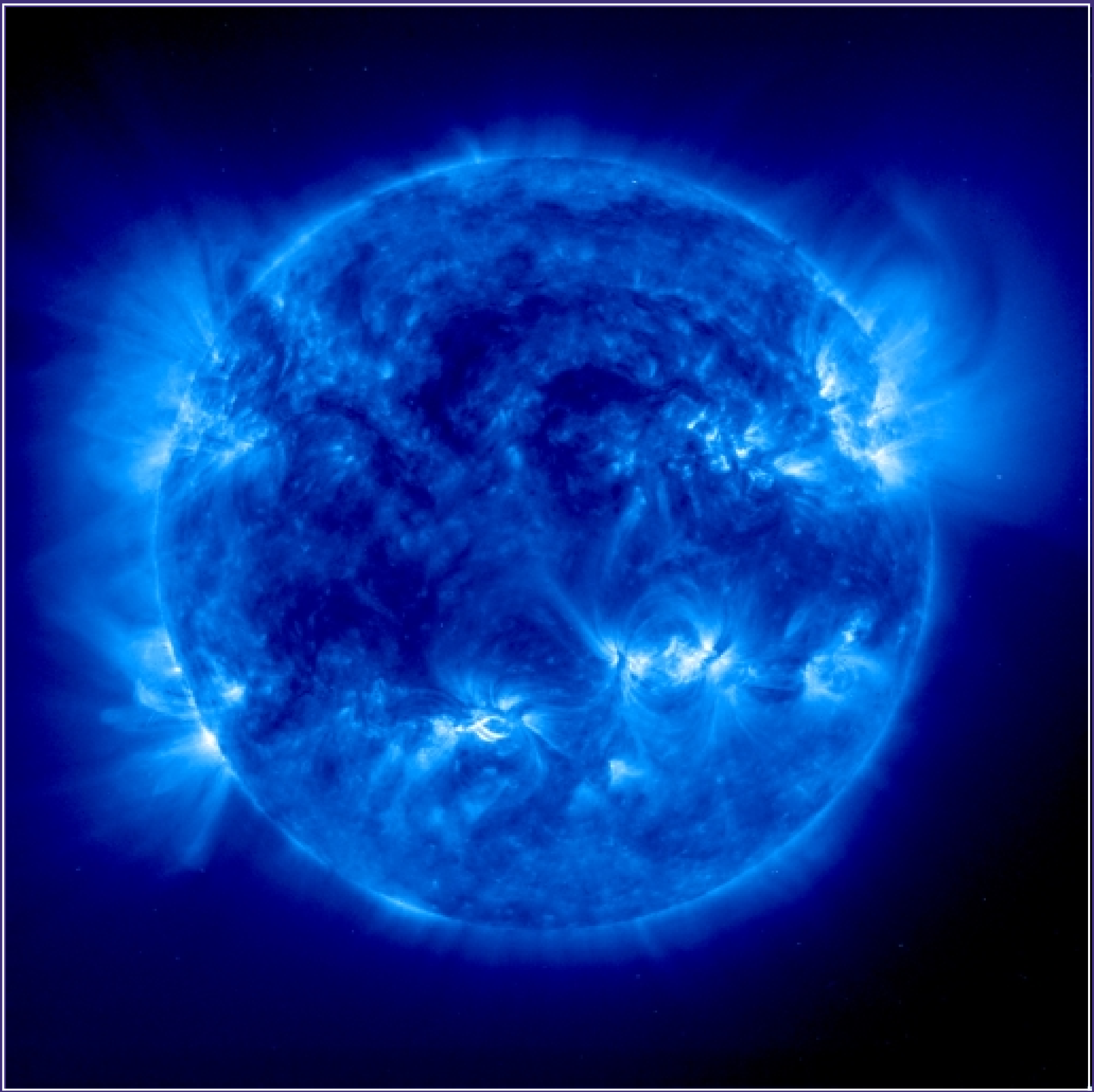
The parts of the Sun



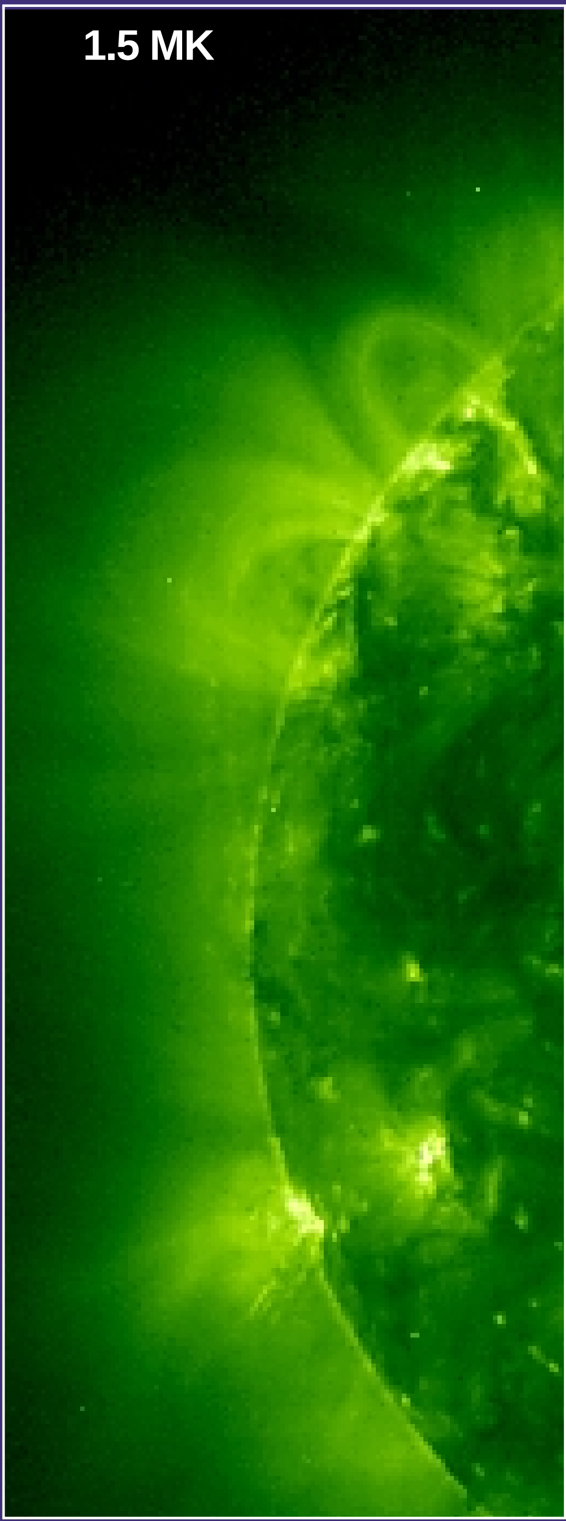
EIT composite image from three wavelengths (171Å, 195Å and 284Å) revealing solar features unqiue to each wavelength

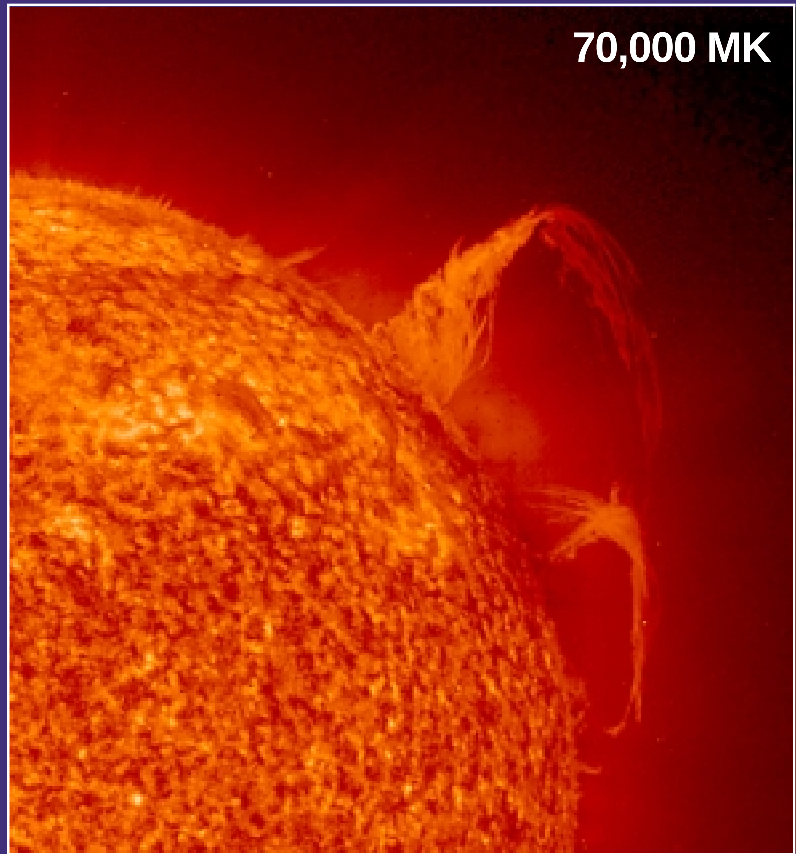


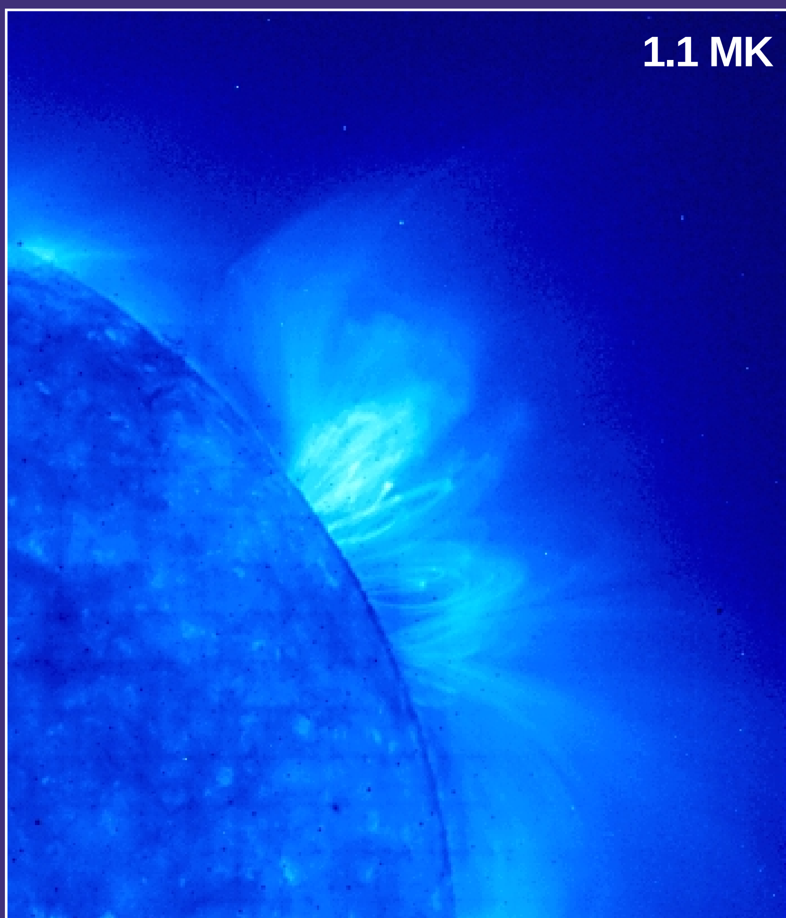
Erupting prominence as recorded by EIT in the He II 304Å line



Active regions and magnetic loops as recorded by EIT in the Fe IX/X 171Å line

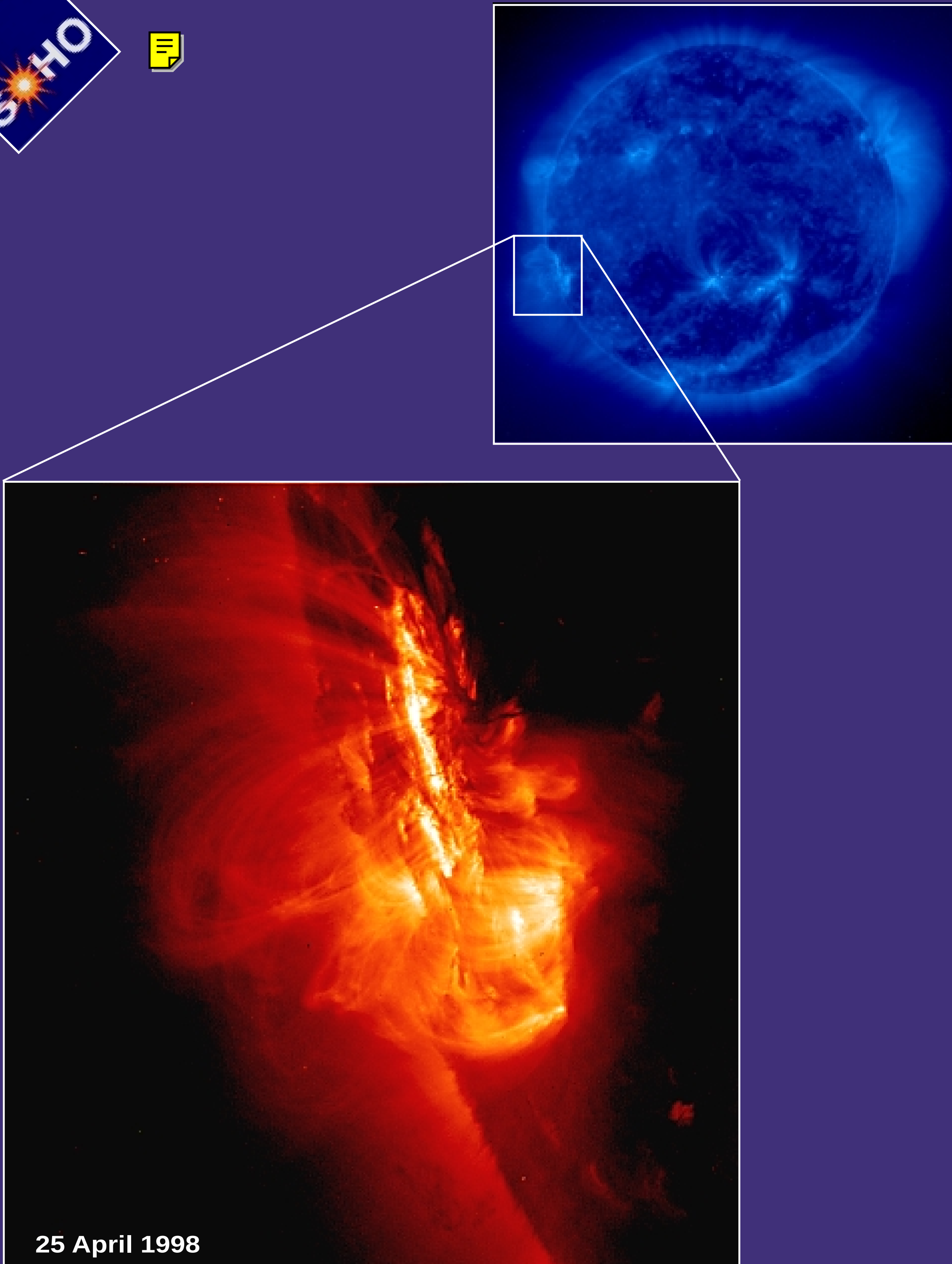




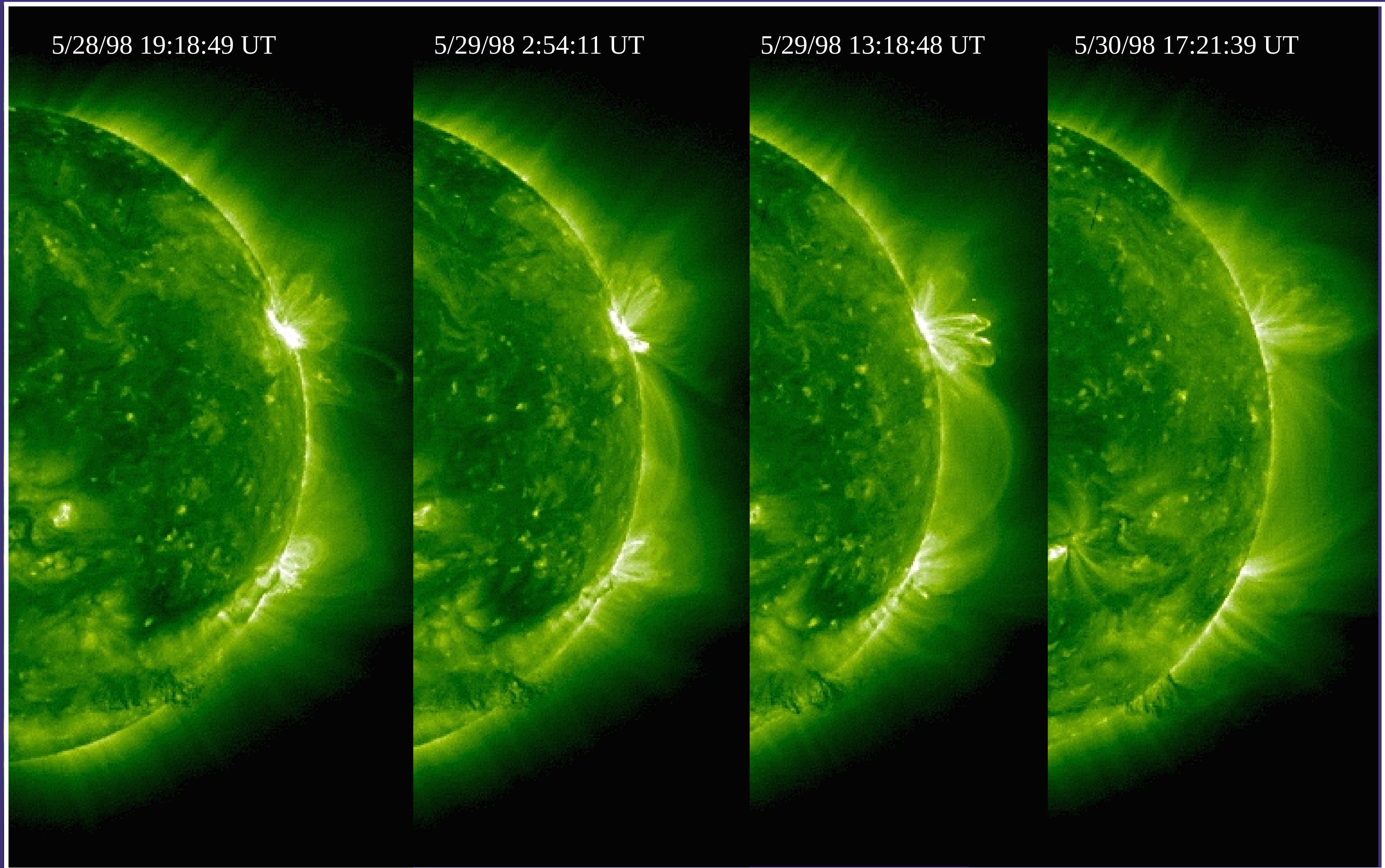


Magnetic loops and prominences captured by the Extreme ultraviolet Imaging Telescope (EIT) in three wavelengths

EIT 171 full disk image

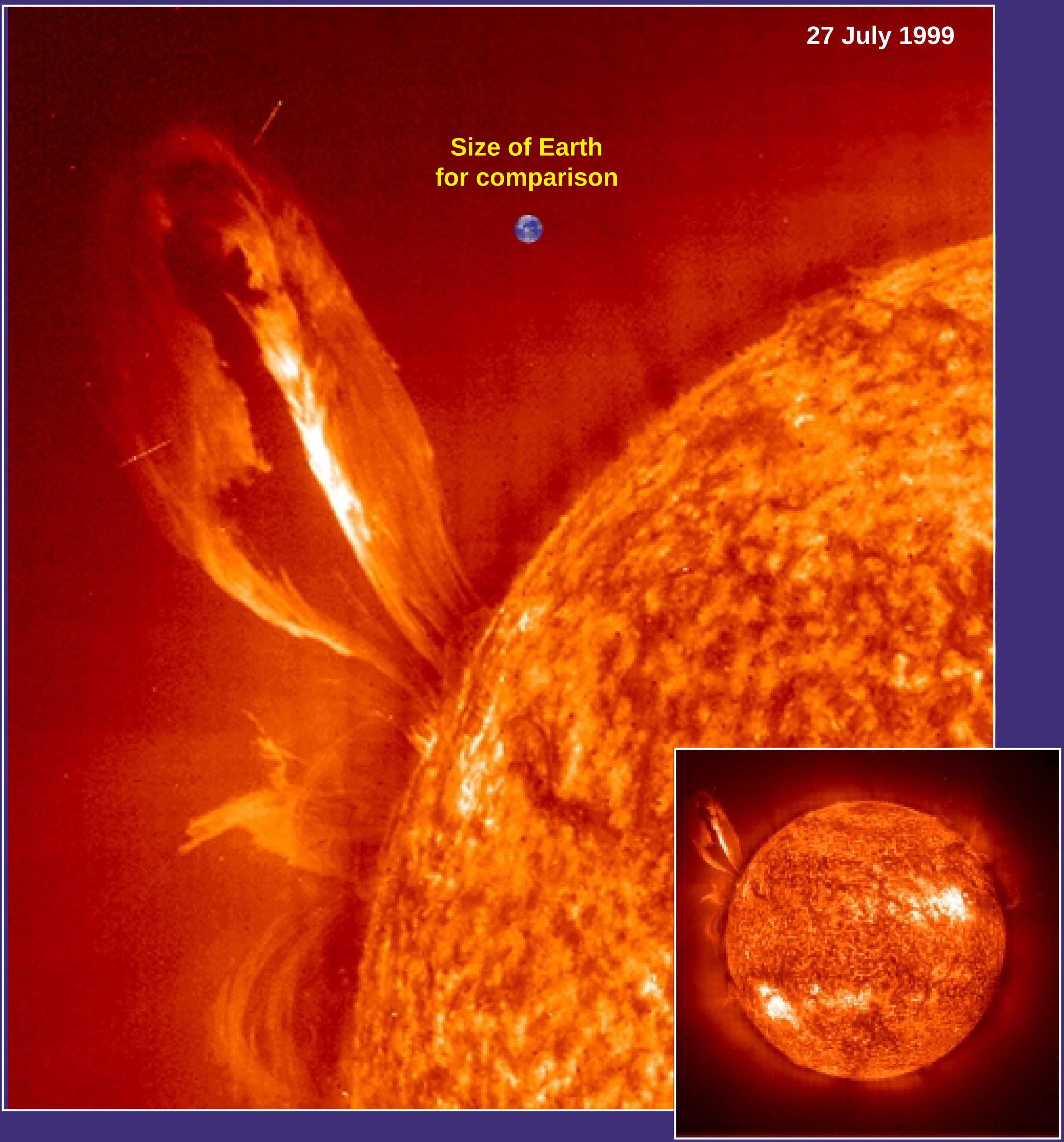


Close-up of an active region in extreme ultraviolet light from NASA’s TRACE (Transition Region and Coronal Explorer) spacecraft

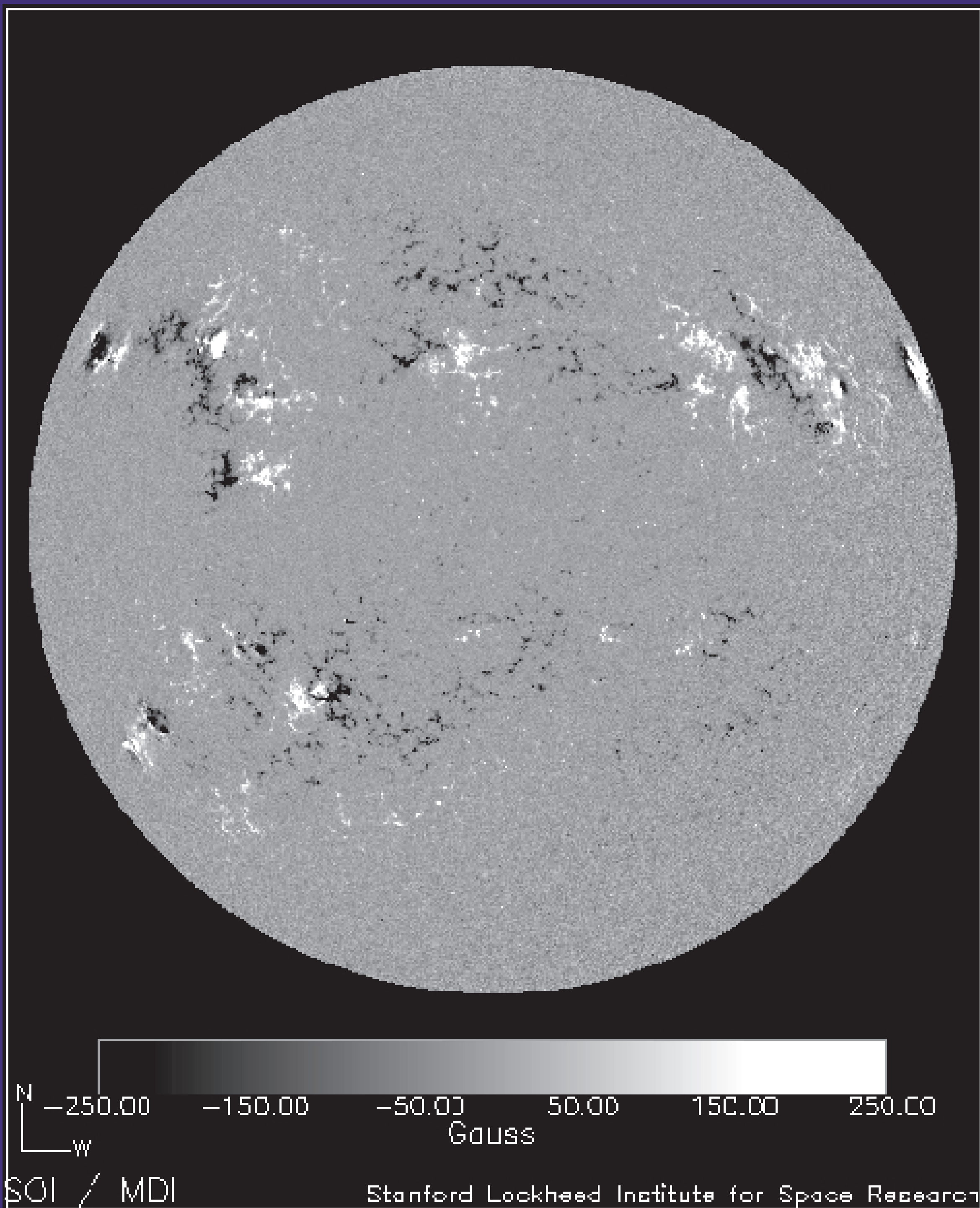


A series of EIT 195Å images over two days shows two active regions connecting their magnetic field lines over a large area of the Sun

Images are Fe XII at 195Å showing the solar corona at a temperature of about 1.5 million K.

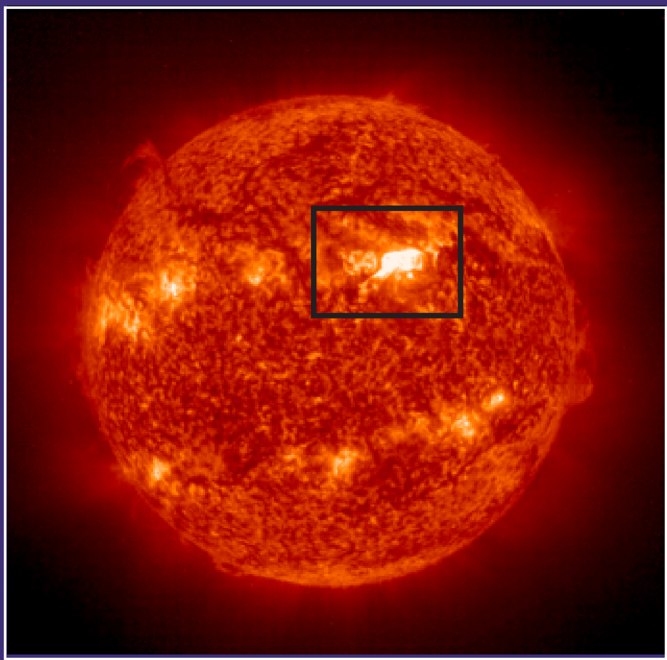


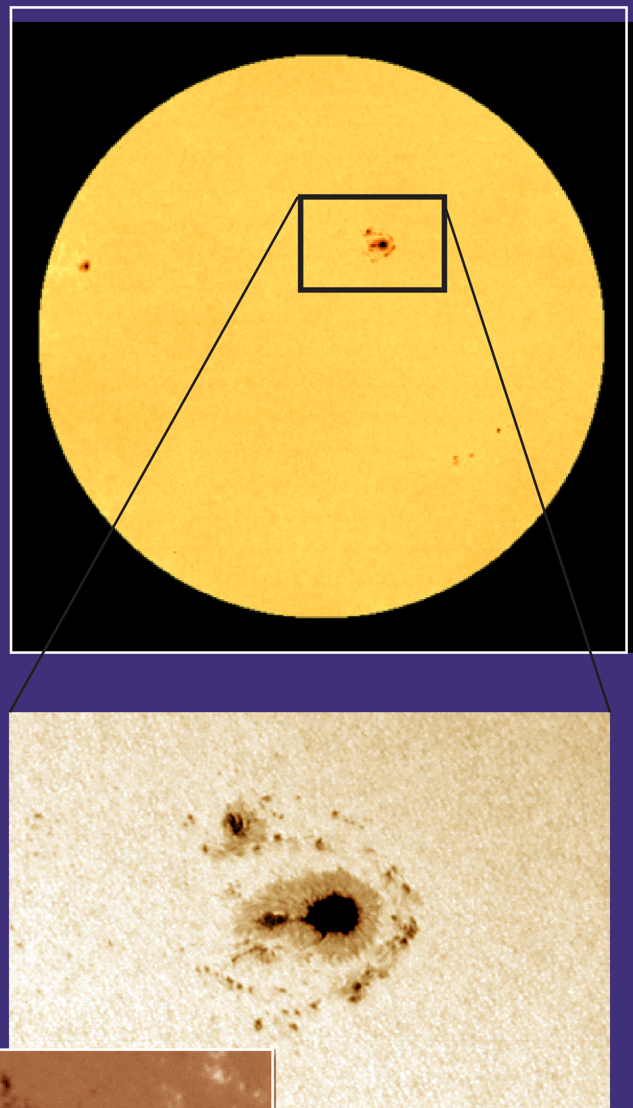
Large, eruptive prominence in He II at 304Å, with an image of the Earth added for size comparison

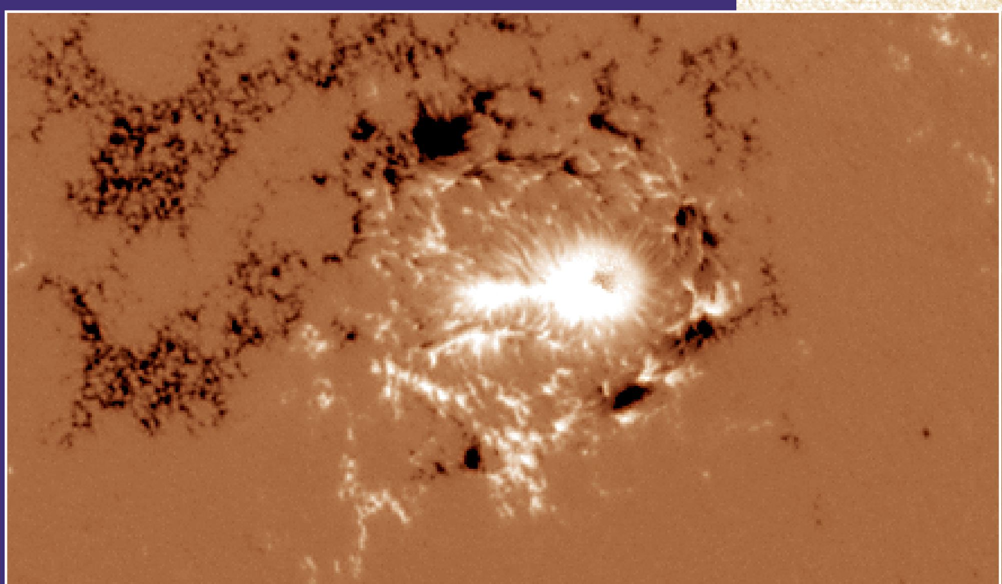


MDI Full Disk Magnetogram
9 May 1999

5 November 1998

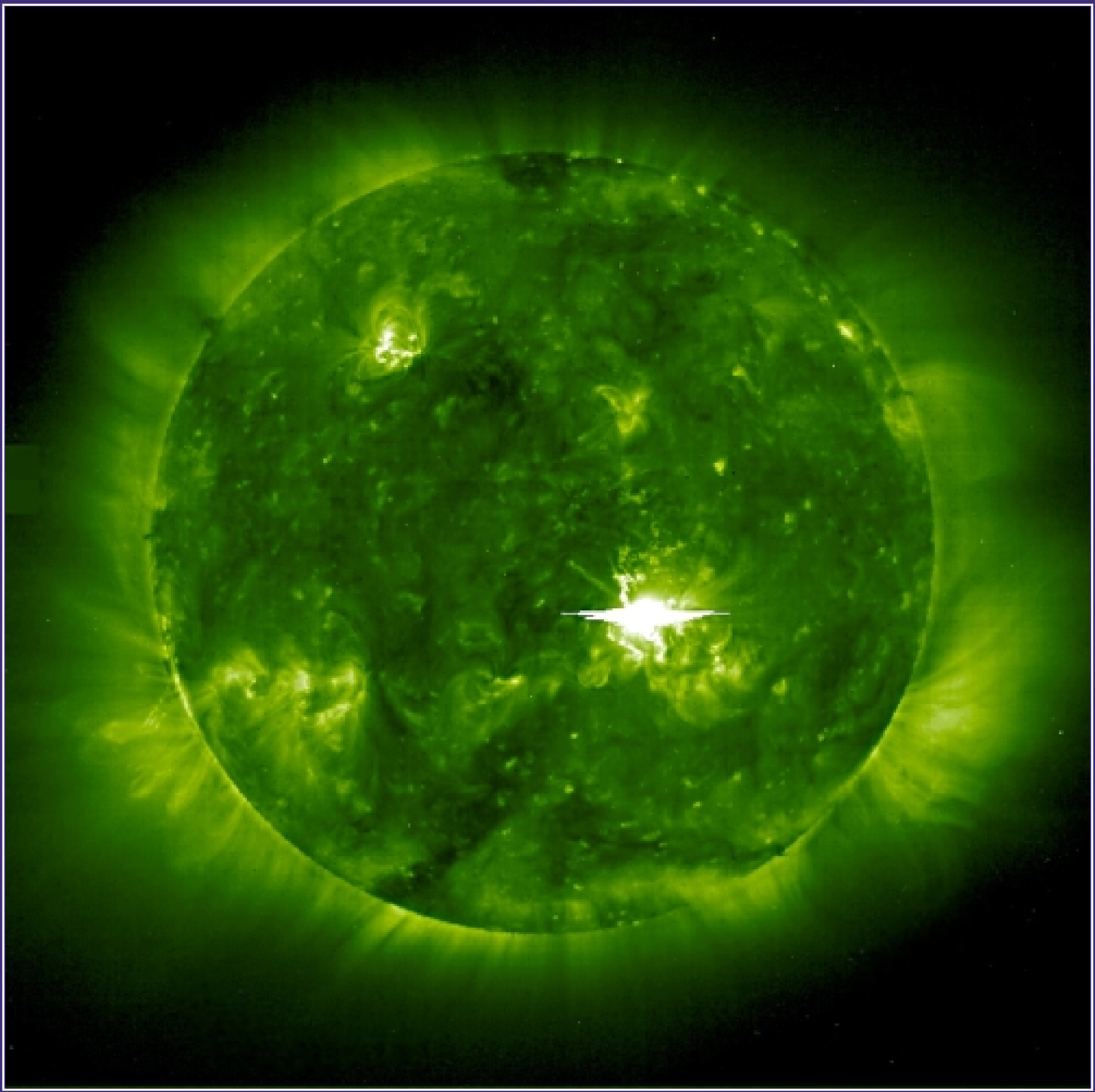






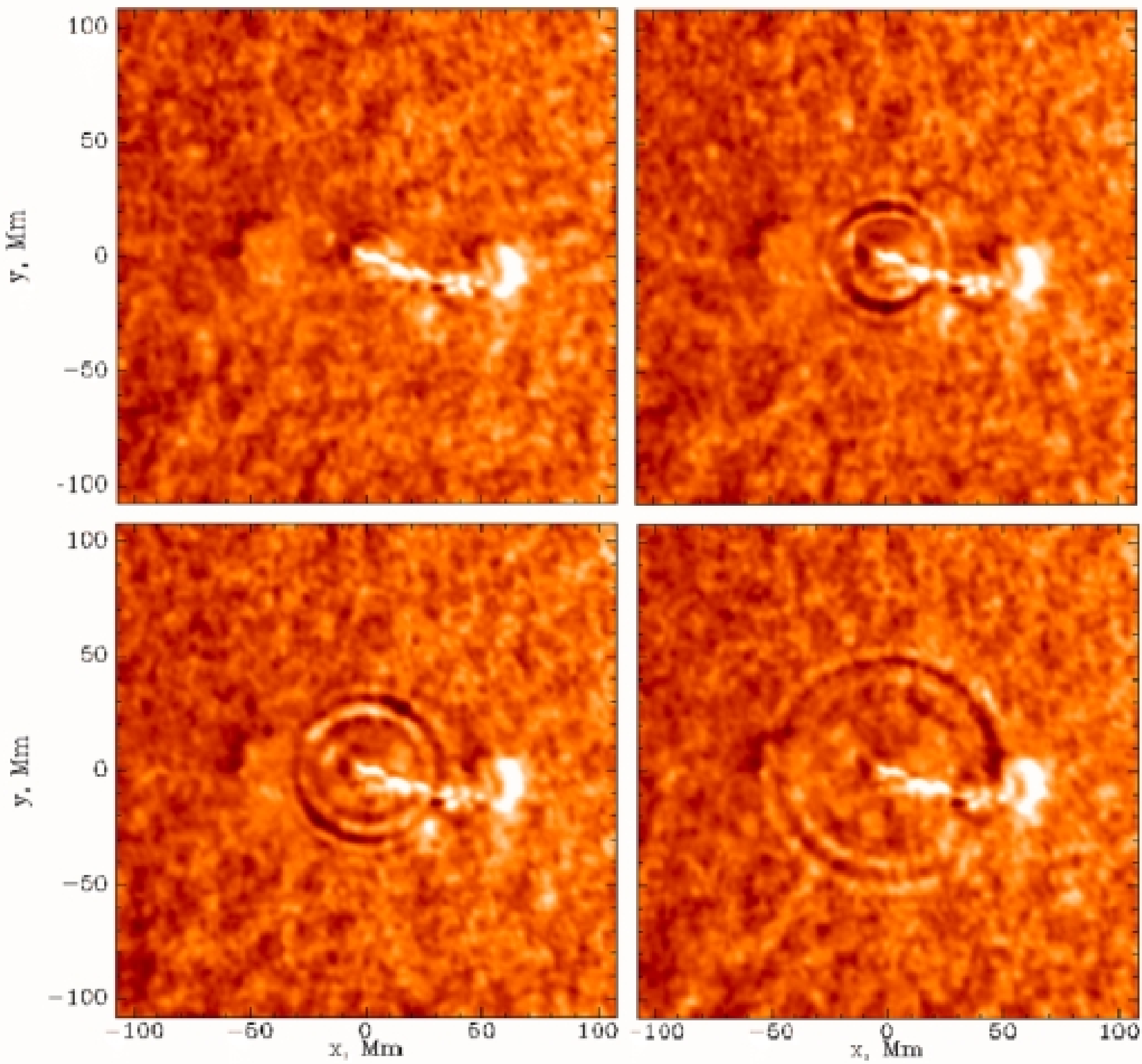
Close-up magnetogram image of sunspots

An EIT 304Å image, an MDI full disk white light image, with a close-up, and a high-resolution magnetogram all view the same magnetic structures that we call sunspots.

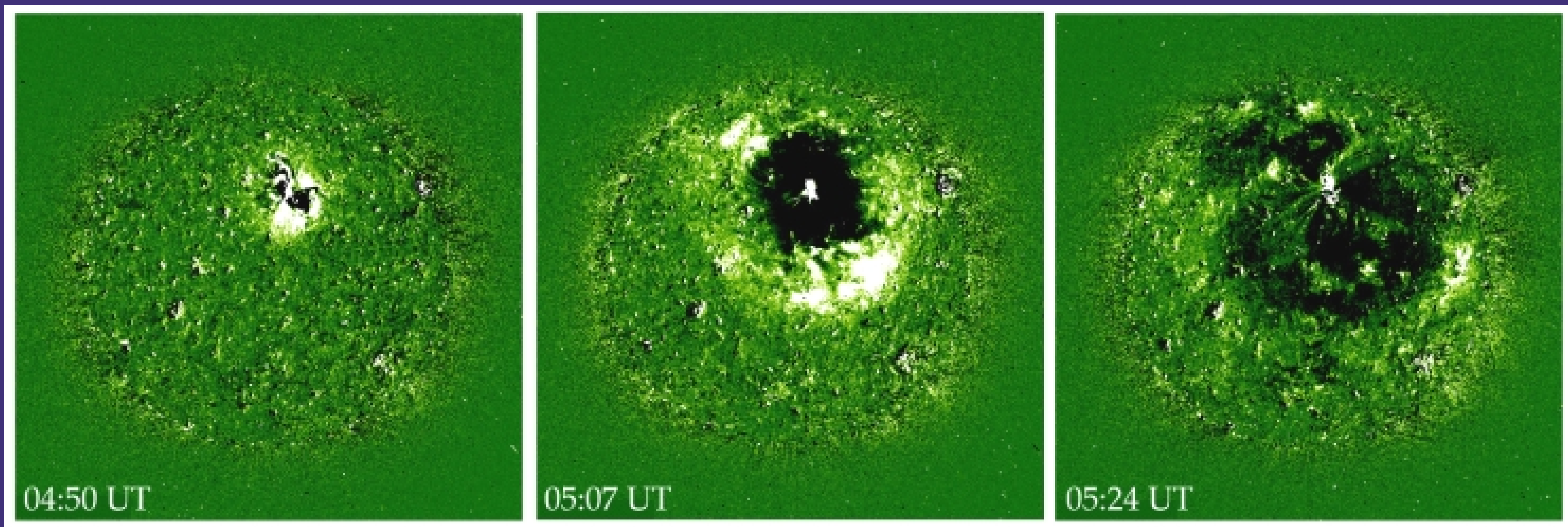


A bright solar flare captured on 2 May 1998 in the 195Å line of Fe XII

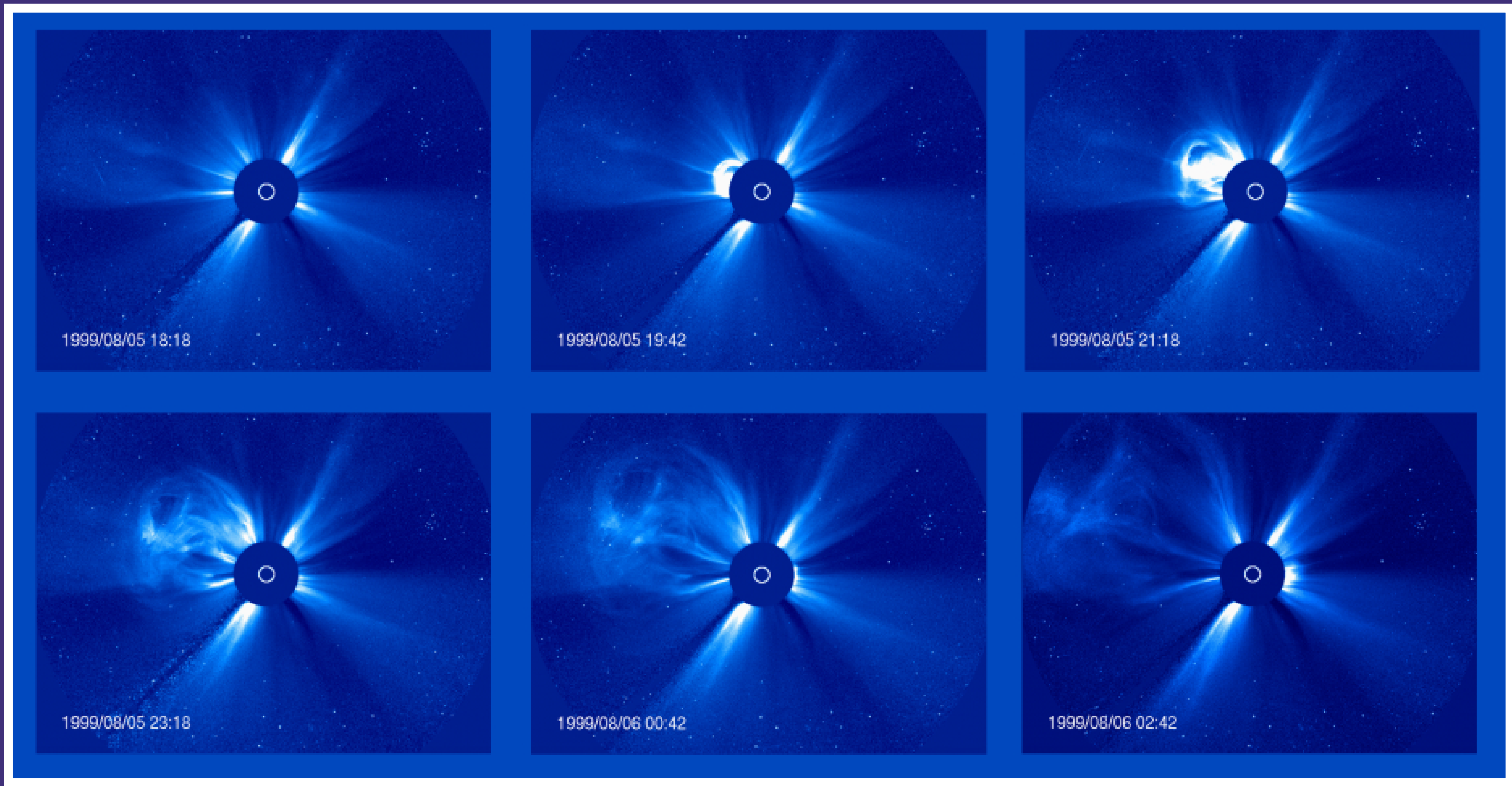
(The horizontal white line on either side of the flare was caused by charge bleeding on the CCD detector.)



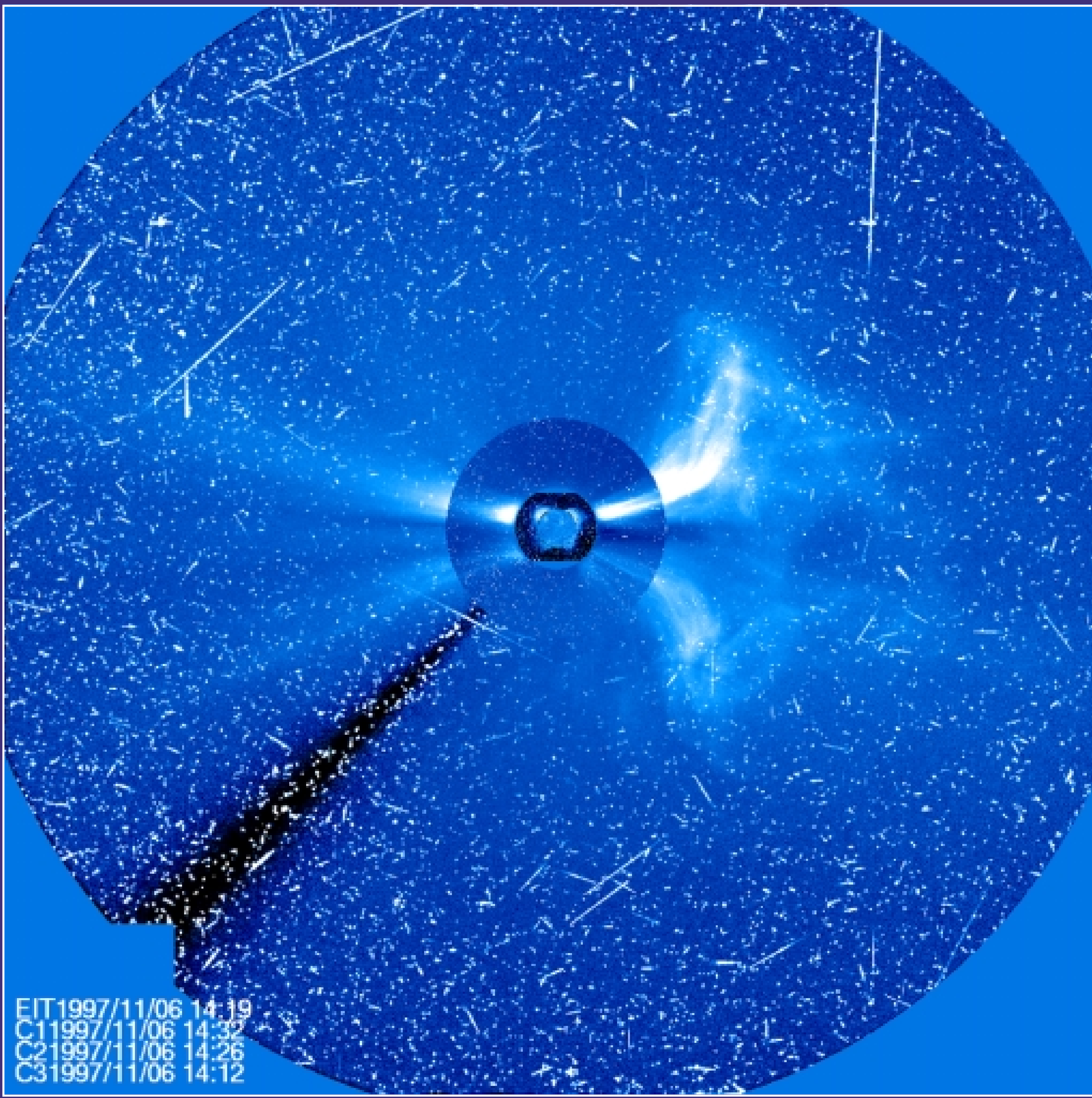
A rapidly expanding “solar quake” on the Sun’s surface as recorded by the Michelson Doppler Imager (MDI). It was caused by a solar flare on 6 July 1996 and spread out more than 100,000 km at the solar surface.



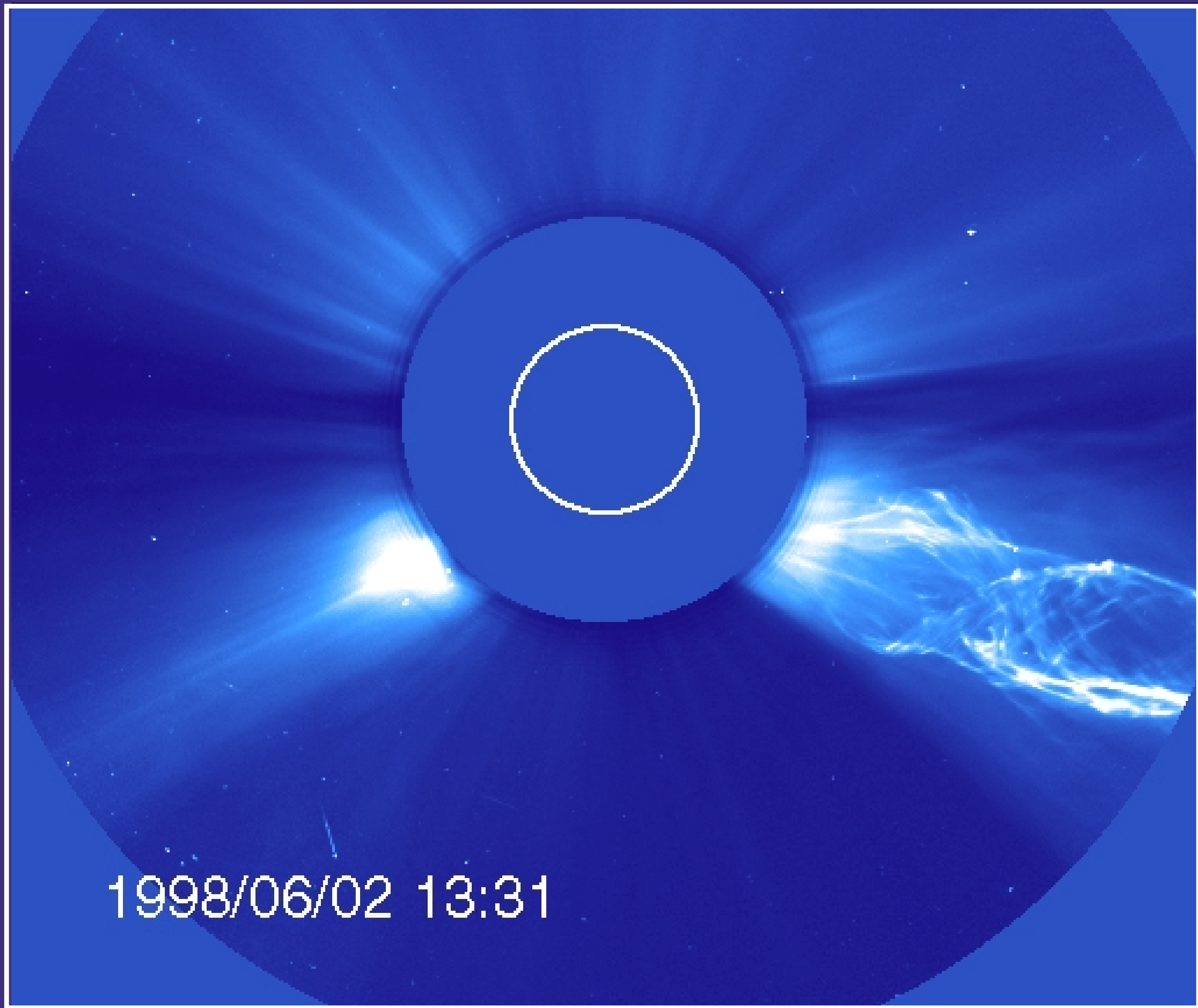
EIT observation of a Moreton wave expanding across much of the Sun’s surface from a coronal mass ejection (CME) initiation site on 12 May 1997. This “running difference” imaging technique emphasizes the chages between successive frames.



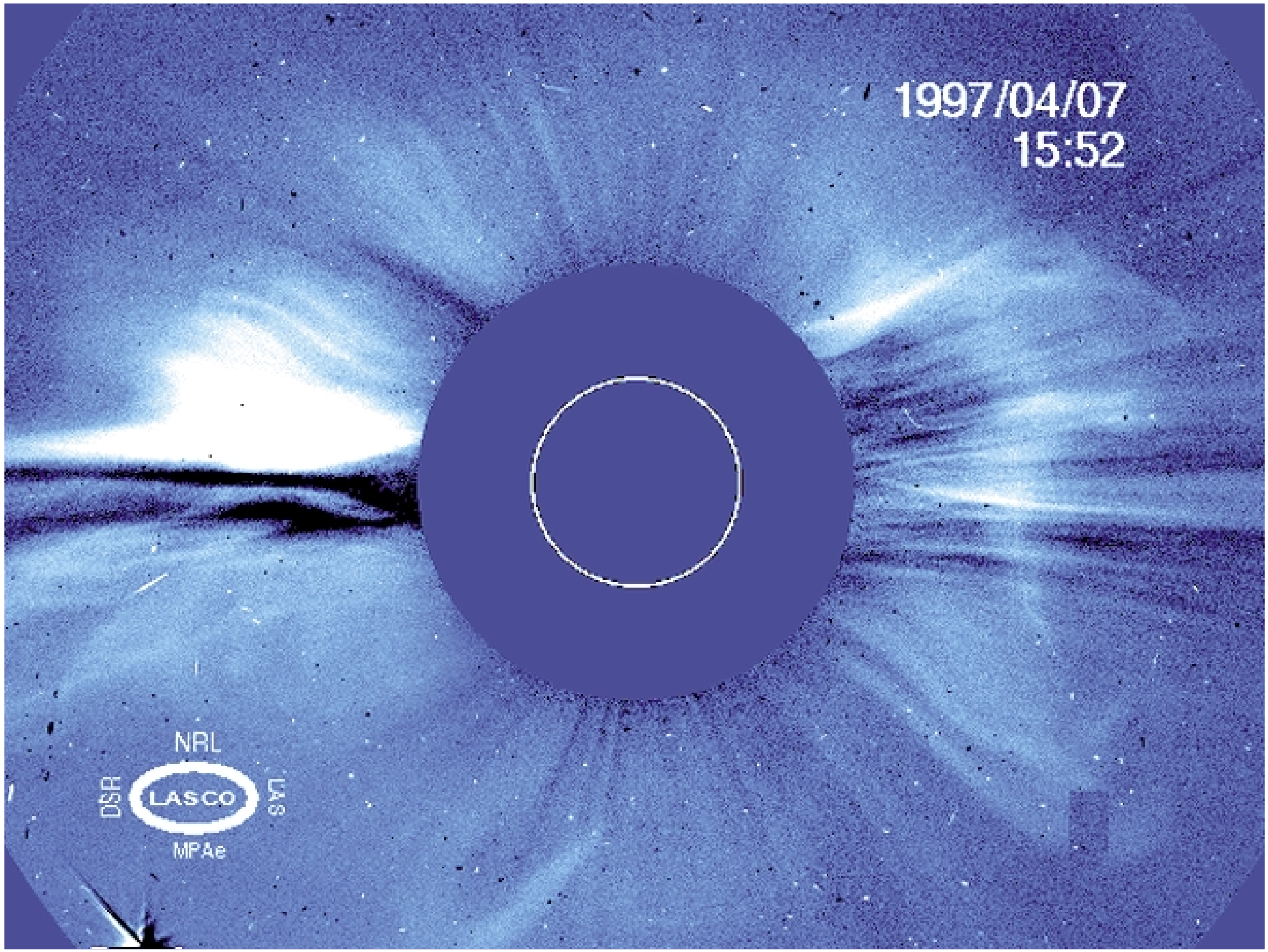
An image sequence showing the progress over eight hours of a clearly defined coronal mass ejection on 5-6 August 1999 taken by LASCO C3.



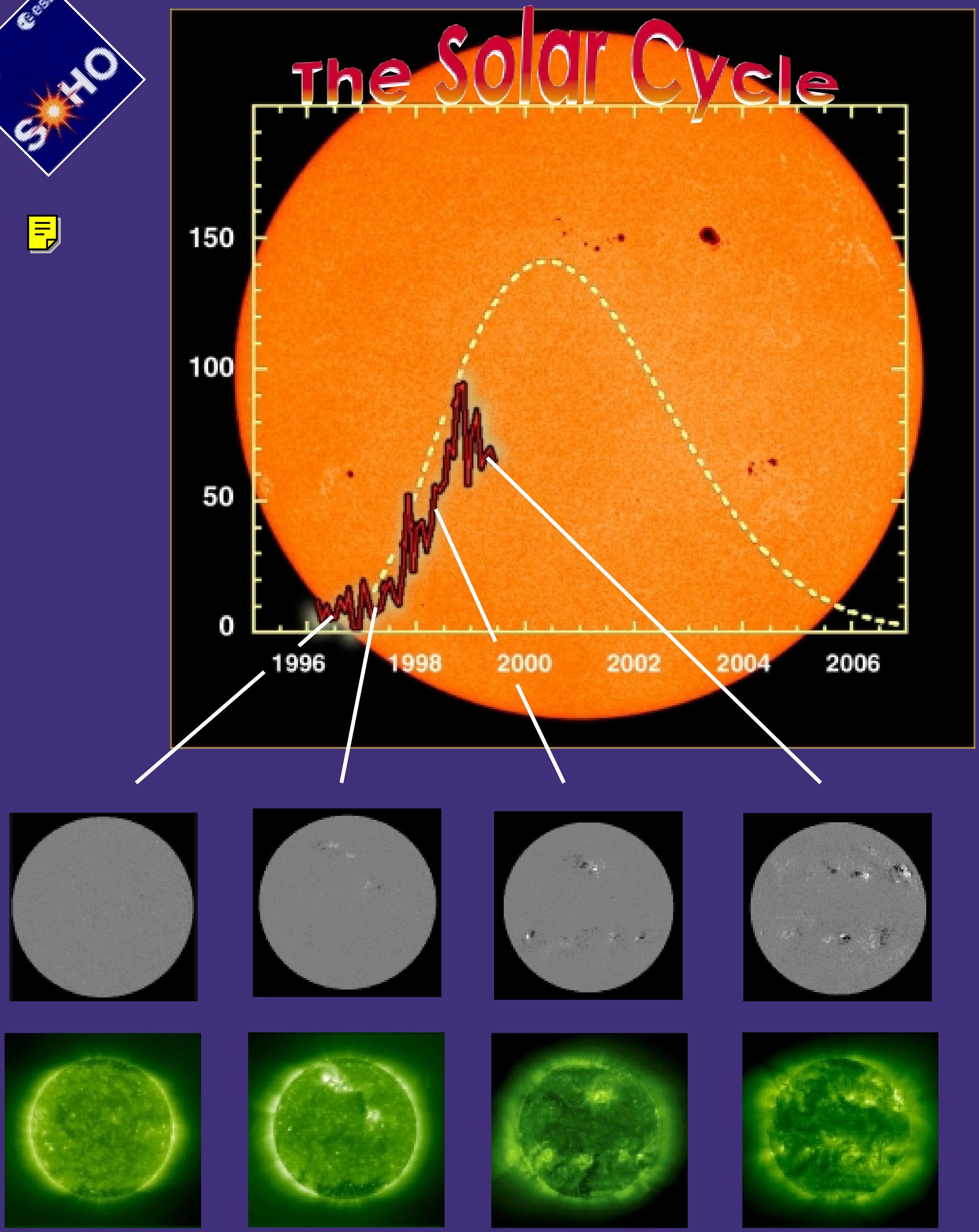
A composite of four images of a large CME from 6 November 1997, which was associated with an X-9.4 flare



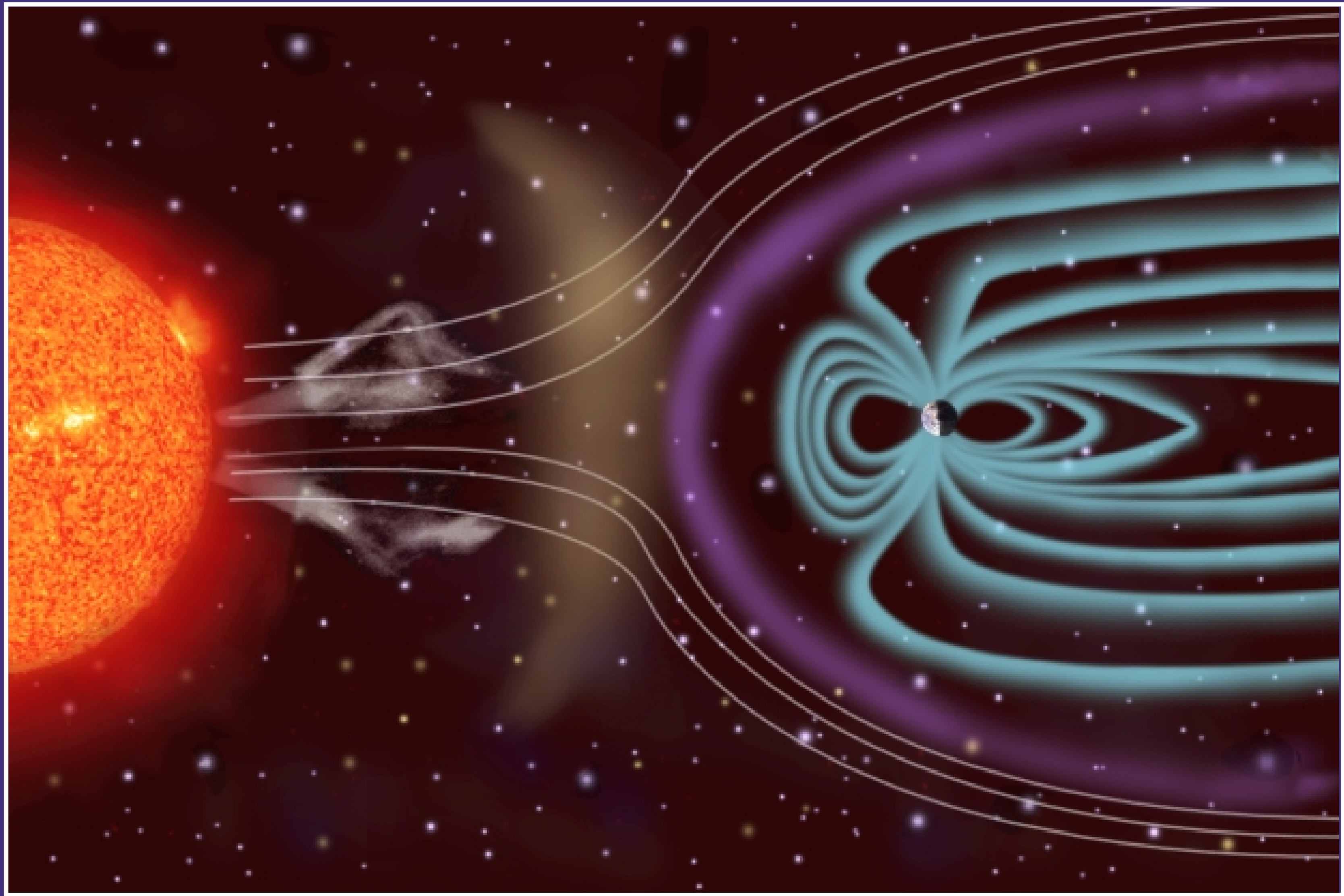
LASCO C2 coronograph image in which a twisting, helical-shaped CME spins off from the Sun



A LASCO C2 “running difference” image showing a “halo” CME blast beginning its journey towards Earth

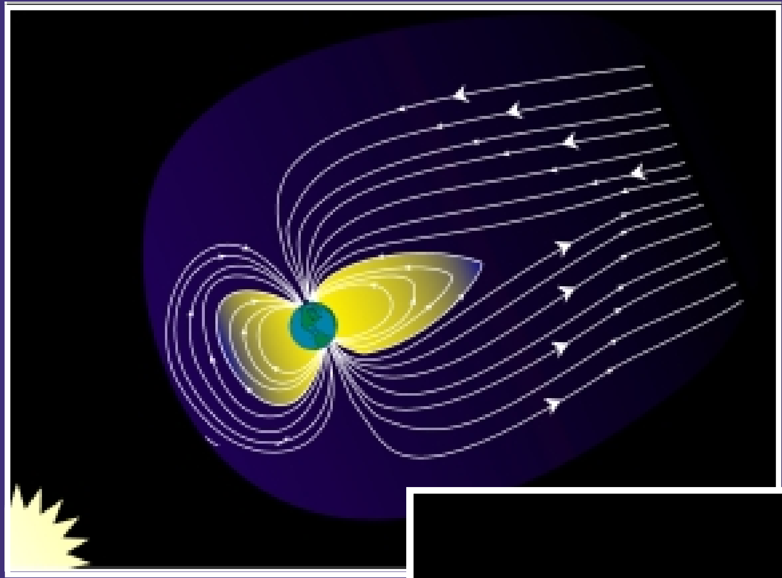


The rise of activity cycle 23 as reflected by the number of sunspots recorded to date and as projected (dotted line). Selected EIT 195Å and MDI magnetogram images are shown.

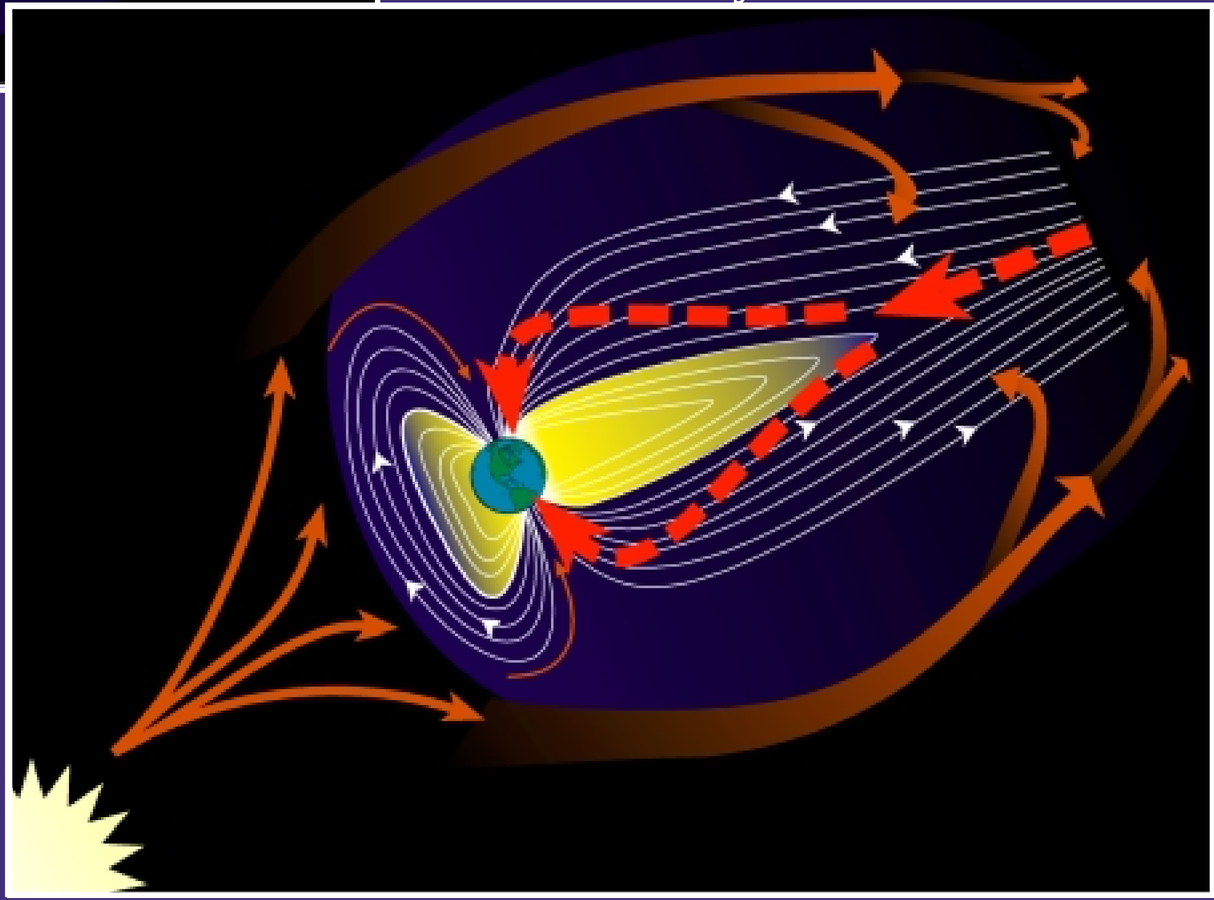


The Sun’s magnetic field and plasma releases directly affect Earth and the rest of the solar system. This schematic view illustrates a magnetic storm approaching Earth and how the solar wind shapes the Earth’s magnetosphere.

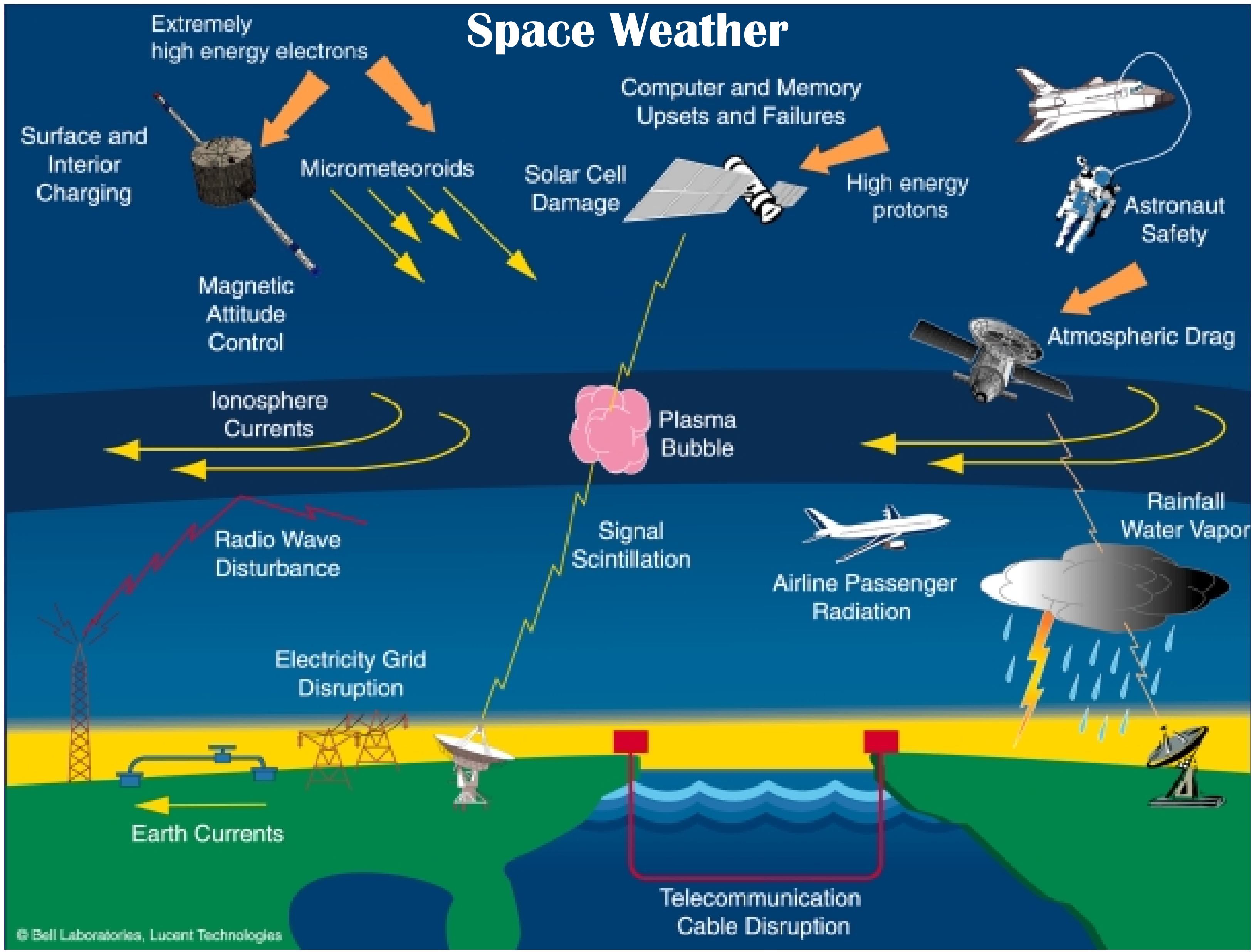
Normal magnetosphere



Magnetosphere being affected by a CME



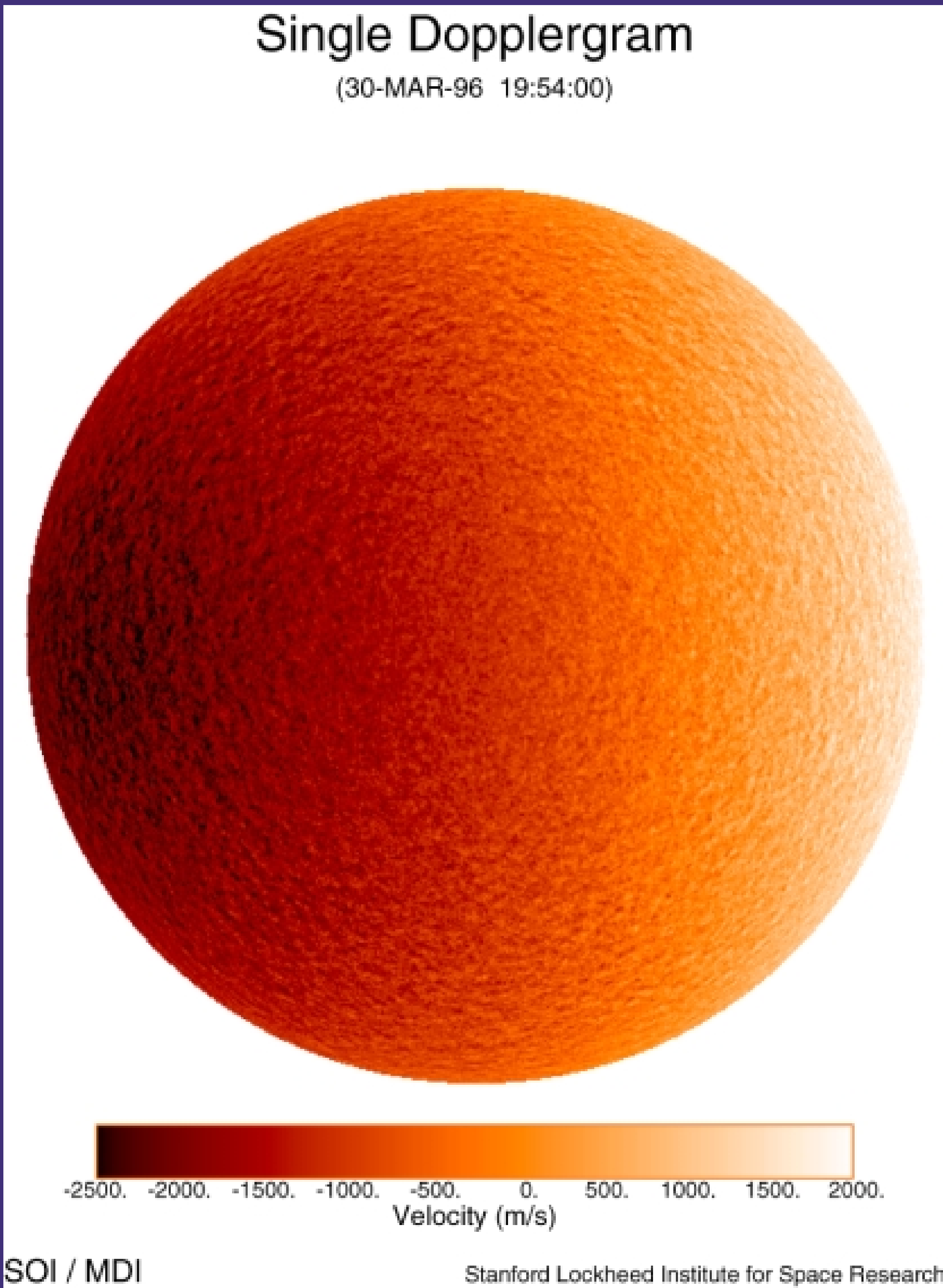
When the particles from a CME impact the Earth's magnetosphere , the sunward side flattens and the tail elongates. Note that most particles are drawn in on the far side.



The numerous effects of space weather

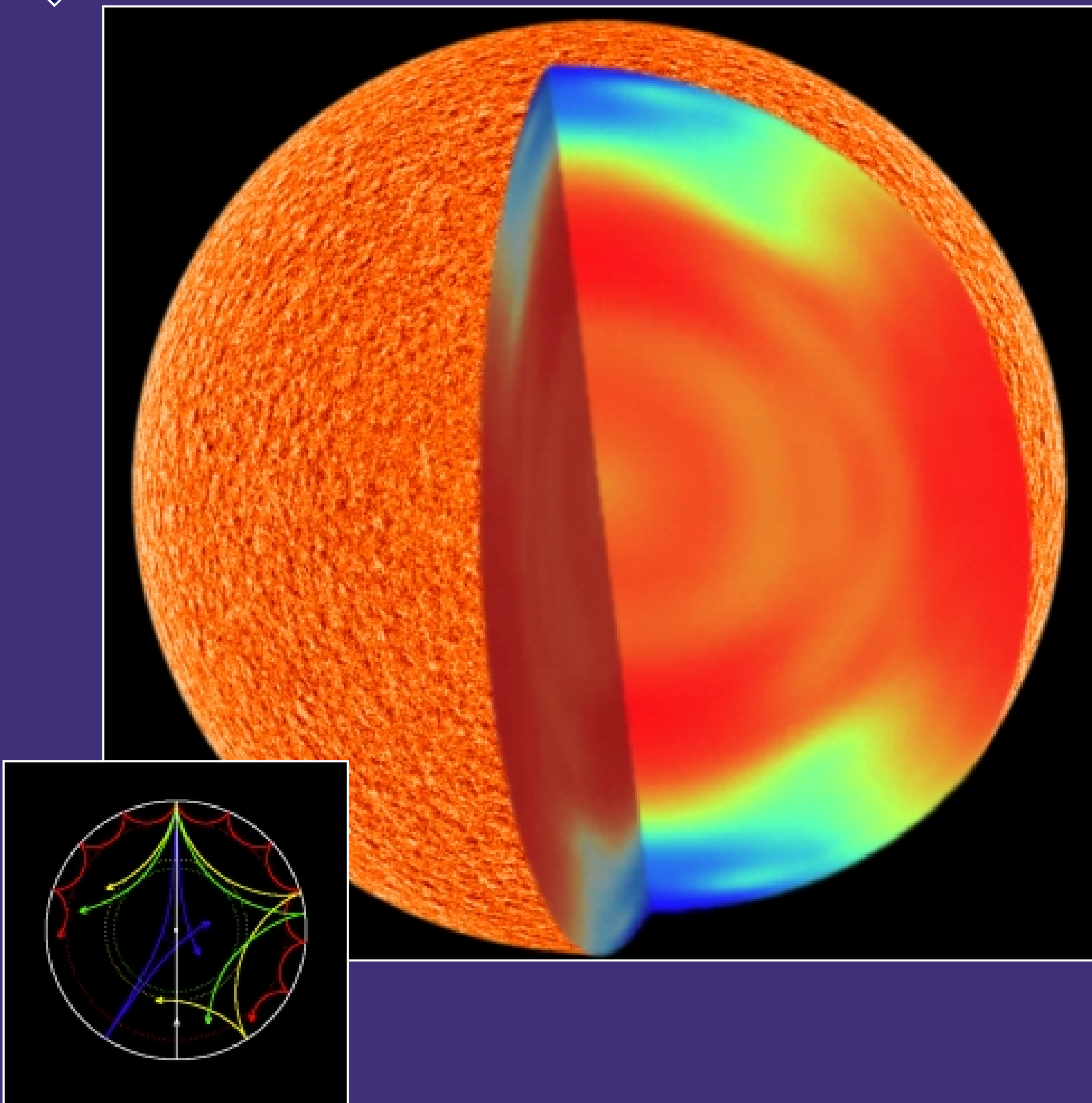
Credit: Jan Curtis

An aurora, the most spectacular visual effect of magnetic storms seen on Earth

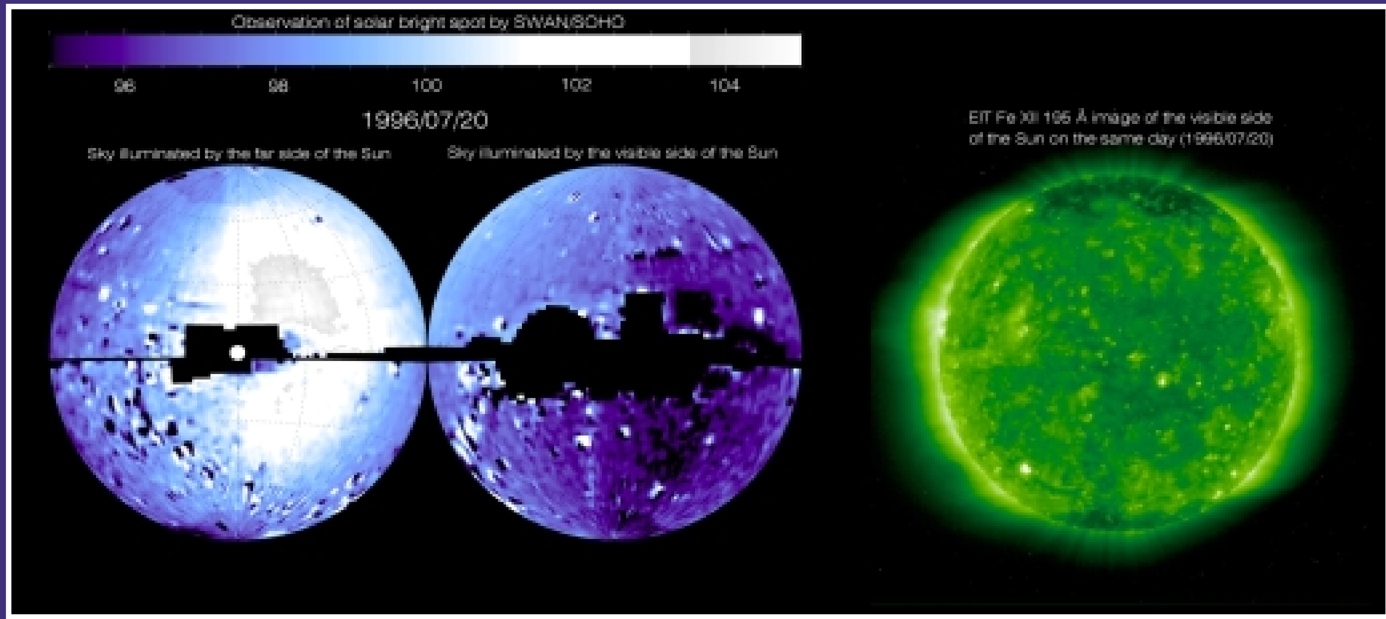


MDI Full Disk Dopplergram

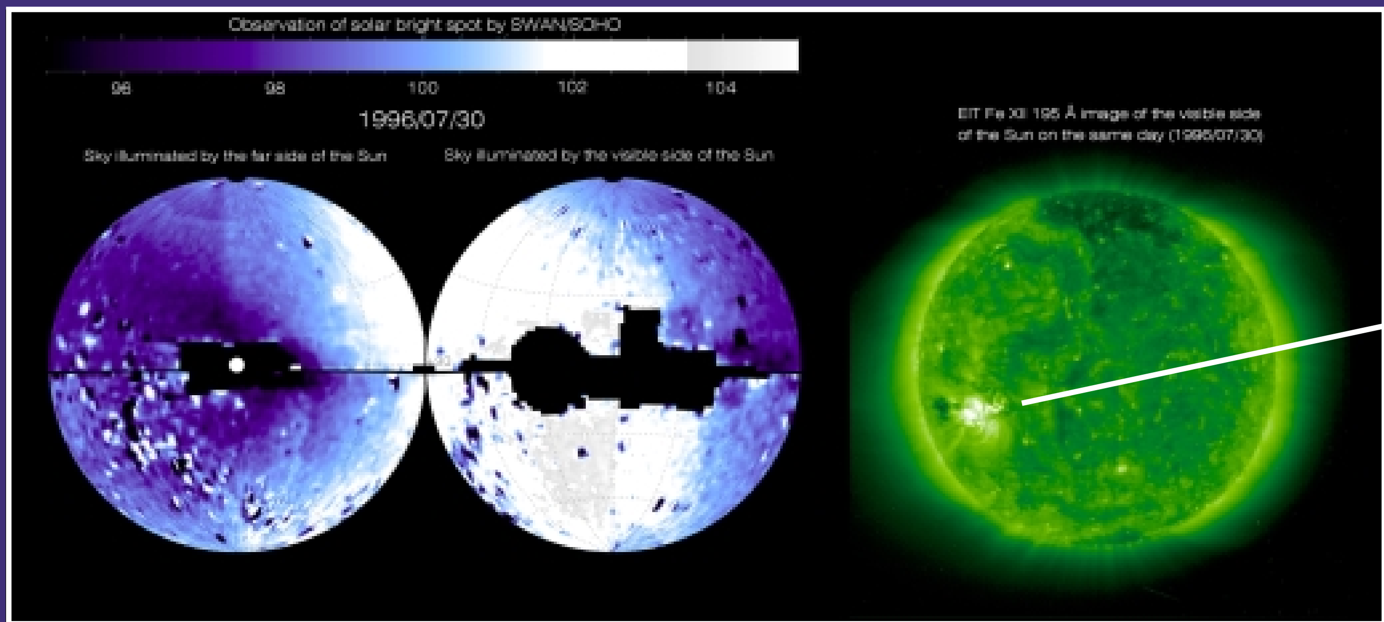
with the dominant feature being the solar rotation (dark colors = motion toward the observer)



An MDI dopplergram image of the Sun's surface is merged with a helioseismology image of the flows of plasma in the solar interior. The smaller diagram shows the paths of several different acoustic (pressure) waves inside of the Sun whose measurements reveal its internal structure.

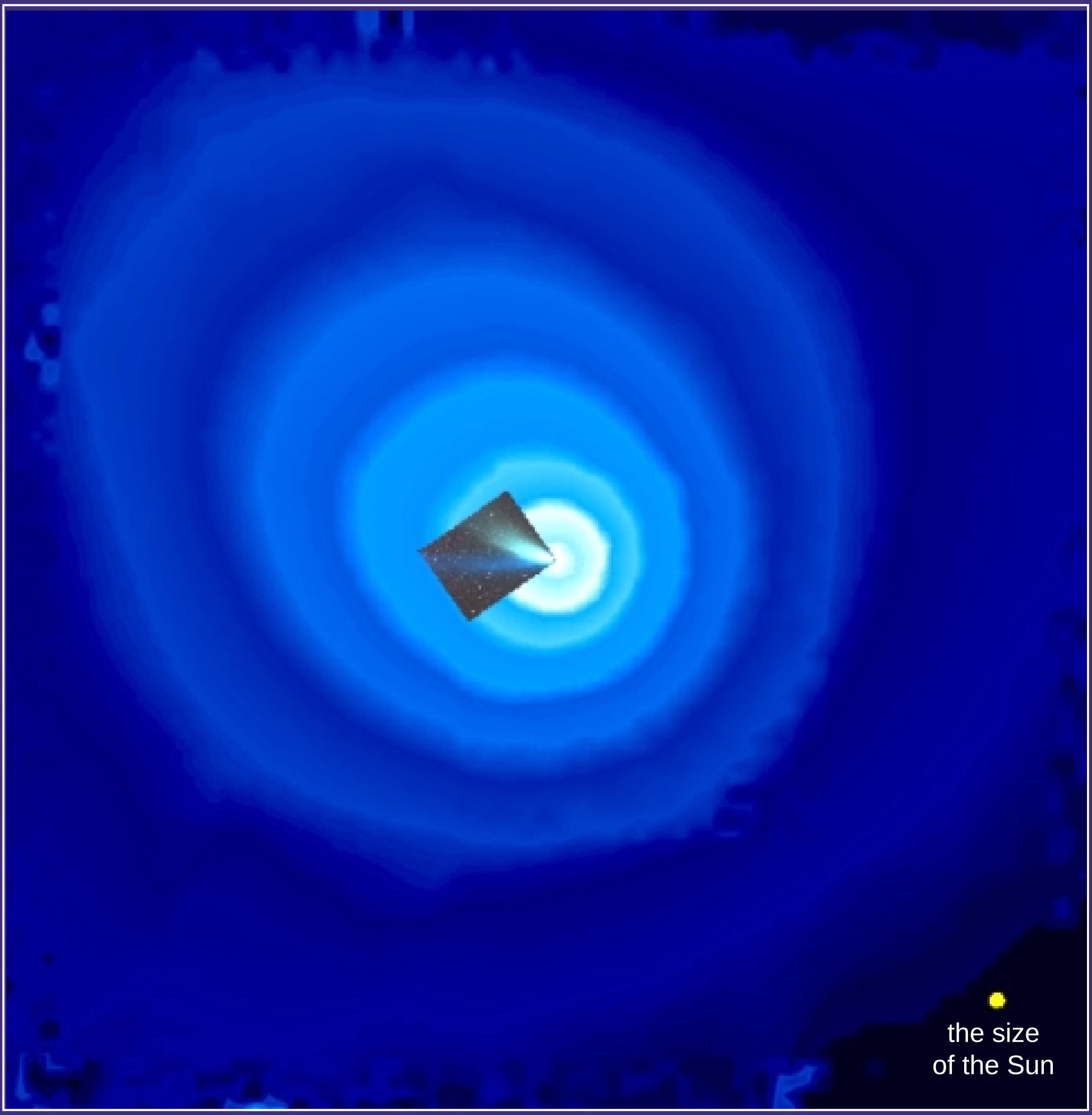


Active region
on the far side

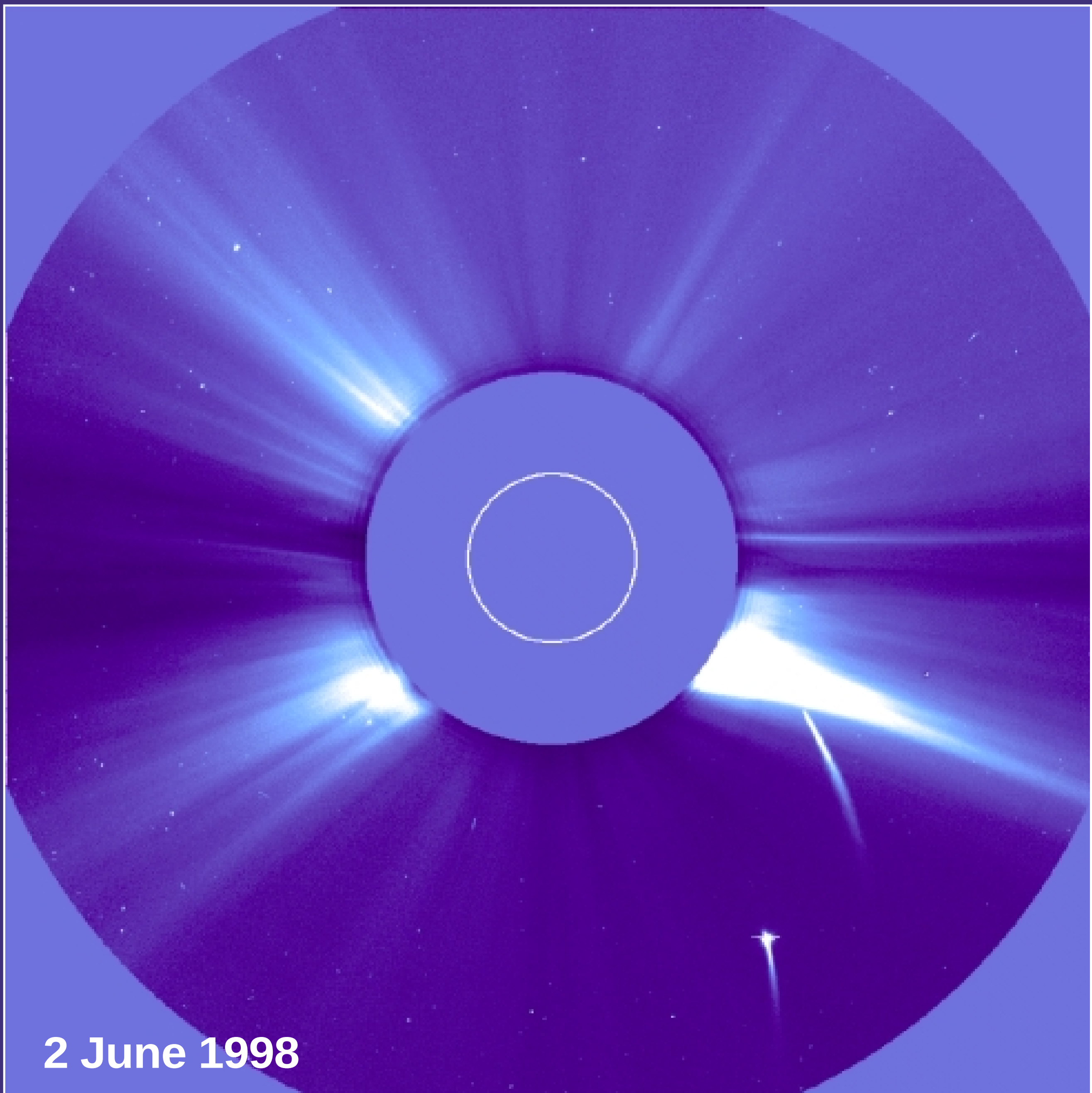


Active region
now visible

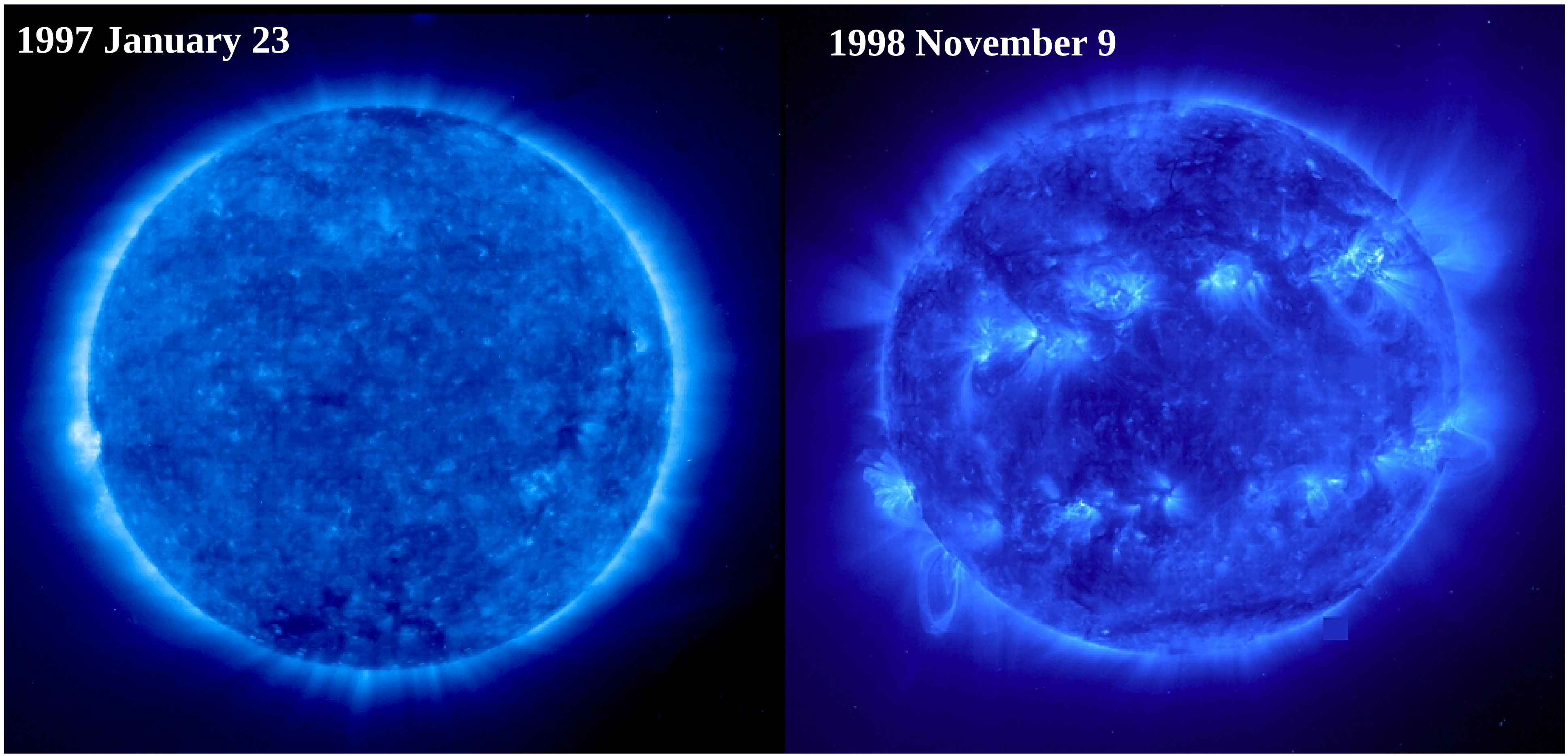
SWAN observation of active regions on the far side of the Sun. Active regions illuminate the distant interstellar hydrogen cloud like a searchlight strikes clouds at night.



SWAN recording of the huge cloud of hydrogen, 70 times the size of the Sun, surrounding Comet Hale-Bopp when it neared the Sun in 1997. Ultraviolet light revealed a cloud 100 million kilometres wide and diminishing in intensity outwards (contour lines).

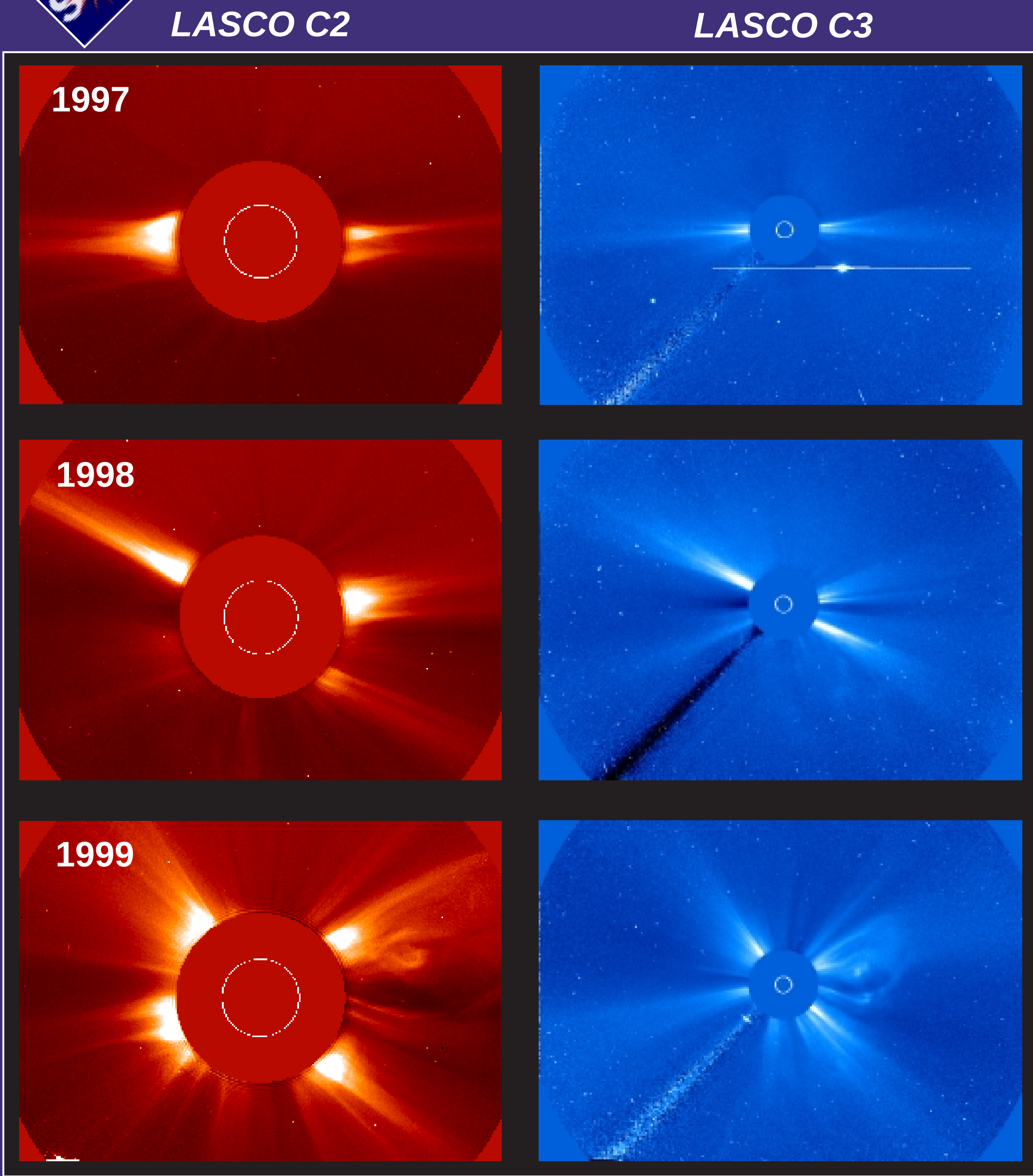


Two “Sungrazing” comets heading in tandem towards the Sun’s corona. They do not reappear on the other side.

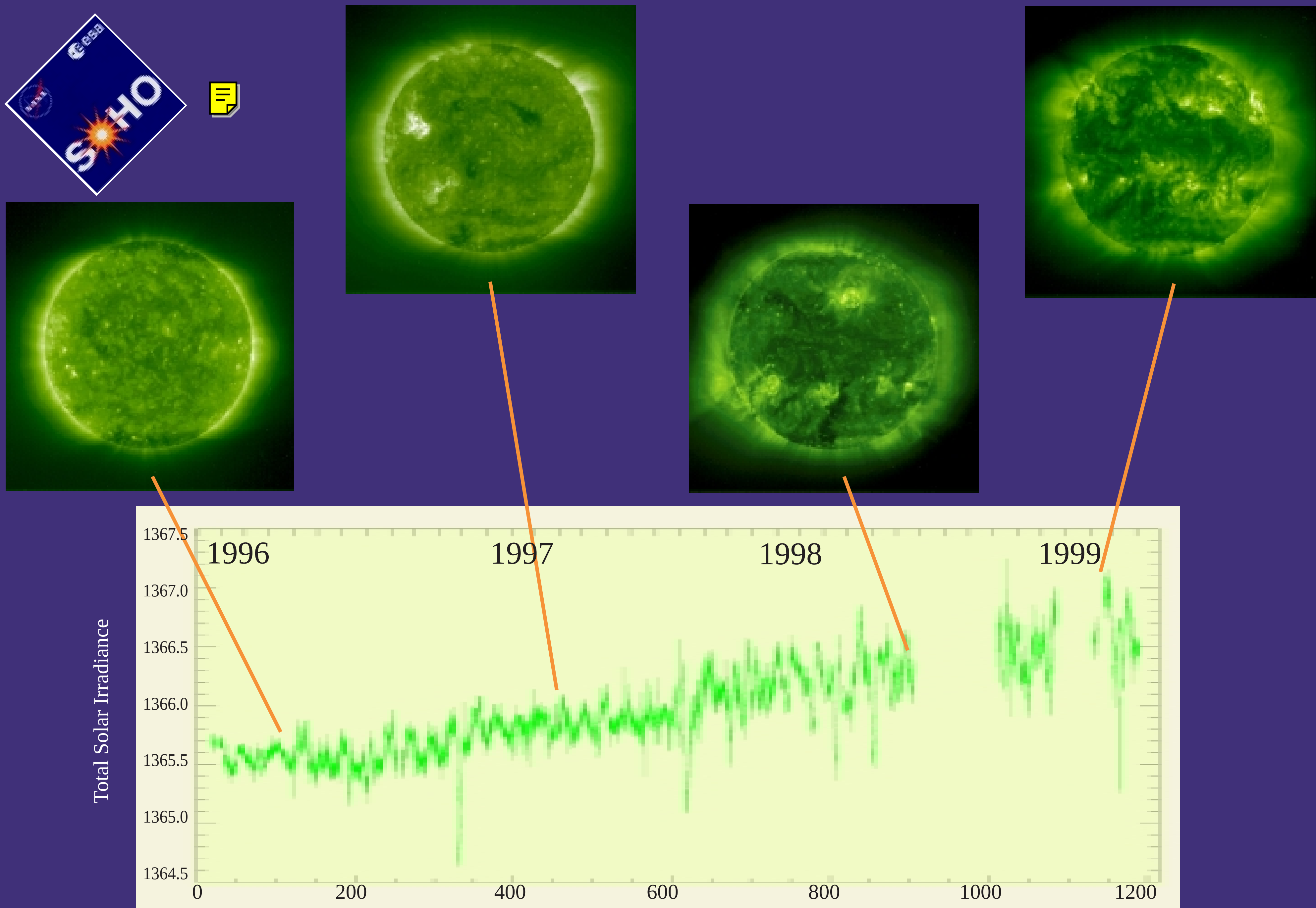


A comparison of two EIT images almost two years apart illustrates how the level of solar activity has increased significantly

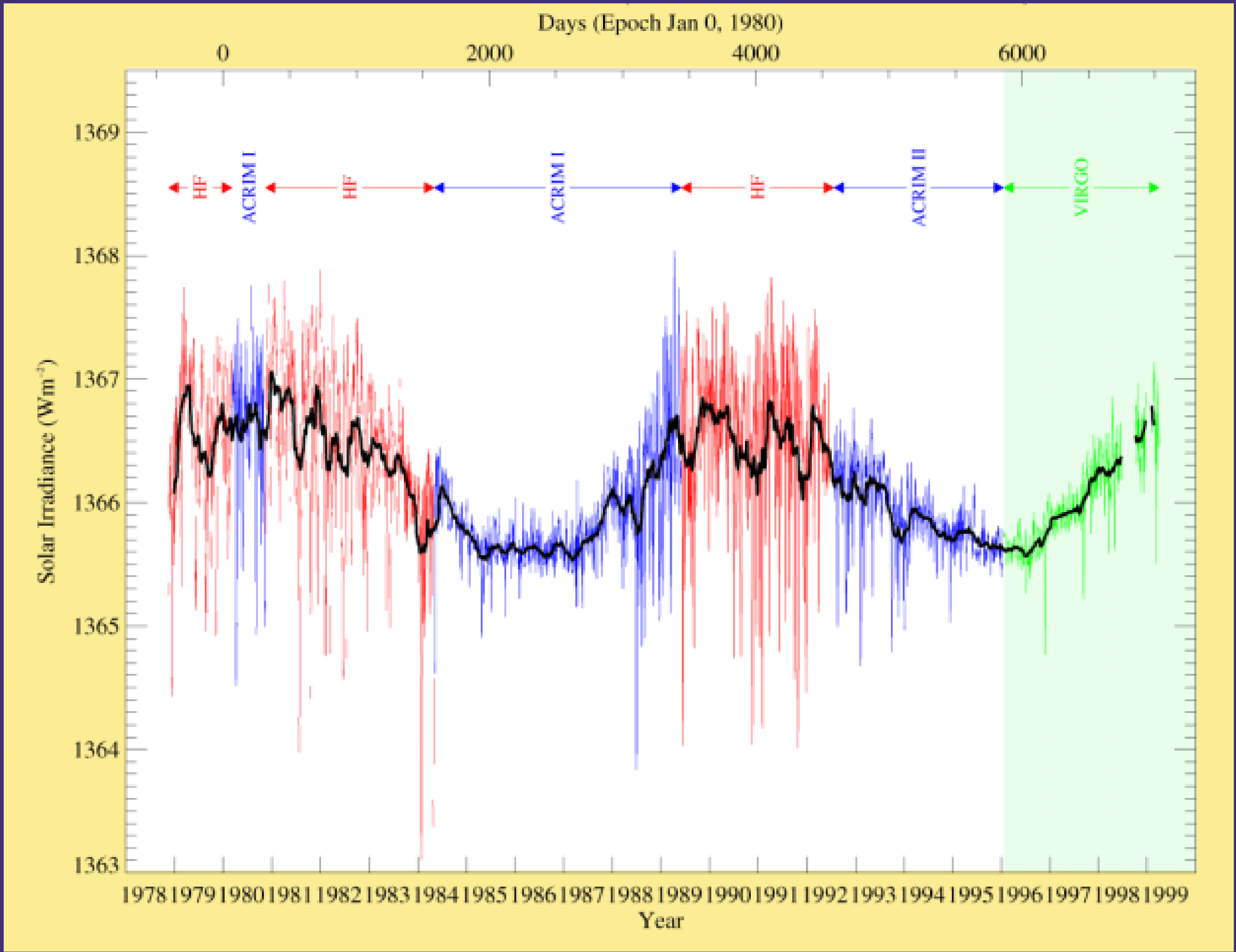
Images are Fe IX/X at 171 Å showing the solar corona at a temperature of about 1 million K.



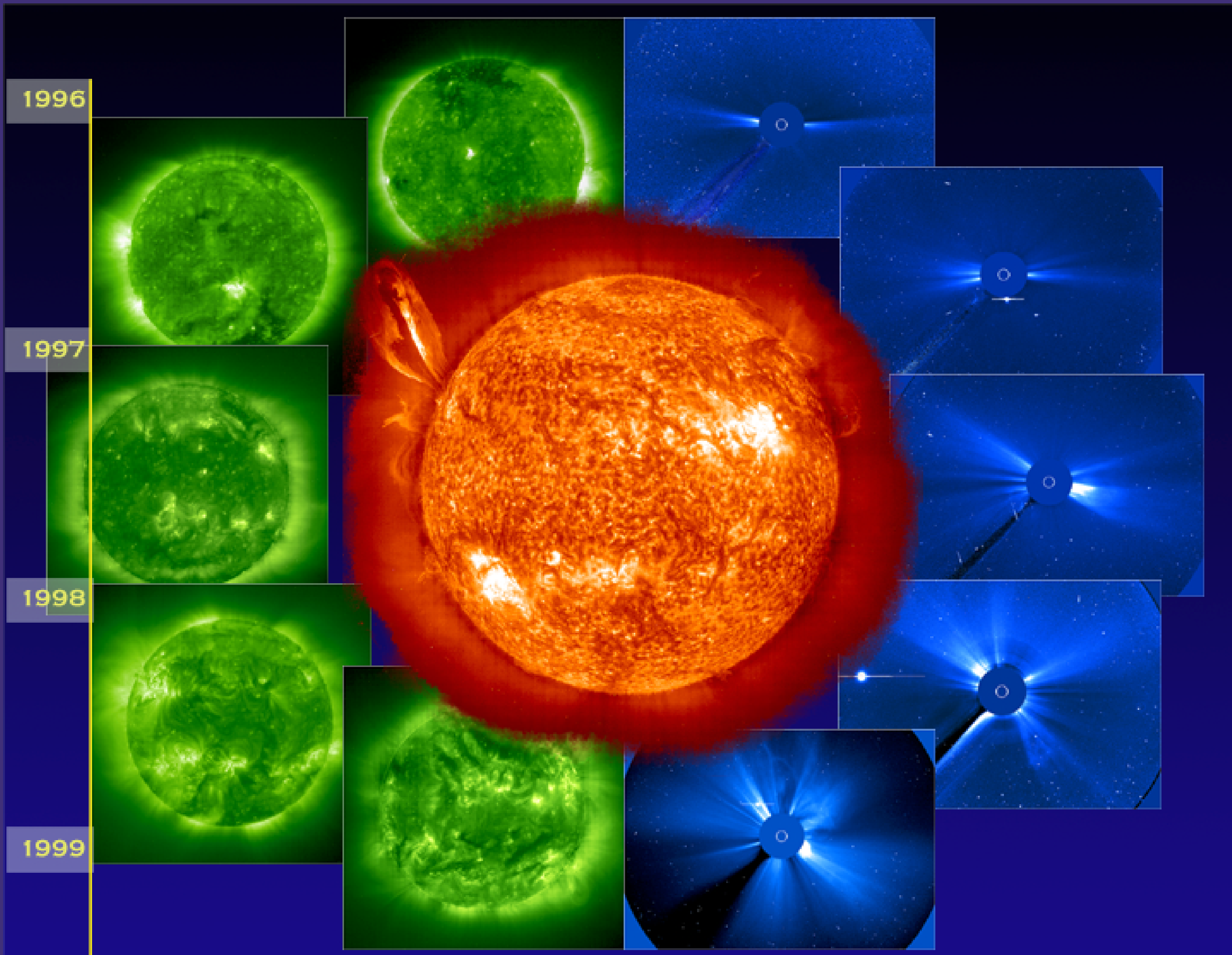
The changing shape and structure of the corona with the solar cycle



Increasing total solar irradiance as measured by VIRGO since SOHO's launch. The EIT full disk images show a corresponding increase in solar activity.



Total irradiance variations during solar cycles 21–23 as recorded by several satellites since 1978. The data shaded in green is from the VIRGO instrument.



The gradual increase in solar intensity as shown in the EIT and LASCO C3 images illustrates the approach of solar maximum